SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Subpart A—General		
1. The authority citation for subpart A of 29 CFR part 1926 is retained as follows: …		CA cites authority at each section.
2. Section 1926.6 is added to read as follows:		
§ 1926.6 Incorporation by reference. (a) The standards of agencies of the U.S. Government, and organizations which are not agencies of the U.S. Government which are incorporated by reference in this part, have the same force and effect as other standards in this part. Only the mandatory provisions (i.e., provisions containing the word ‘‘shall’’ or other mandatory language) of standards incorporated by reference are adopted as standards under the Occupational Safety and Health Act. The locations where these standards may be examined are as follows: (1) Offices of the Occupational Safety and Health Administration, U.S. Department of Labor, Frances Perkins Building, Washington, DC 20210. (2) The Regional and Field Offices of the Occupational Safety and Health Administration, which are listed in the U.S. Government Manual.		Per FR page 47919, this is primarily a “technical amendment,” relocating referenced standards from 1926.31 to 1926.6 for “organizational purposes.” The FR (page 47919) made the following statement: “OSHA is adding to the list of documents incorporated by reference those documents that are newly incorporated by reference in these final rules. The Federal Register approved these documents, which are listed as follows, for incorporation by reference as of November 8, 2010: ANSI B30.5–1968; ASME B30.2–2005; ASME B–30.5–2004; ASME B30.7–2001; ASME B30.14–2004; AWS D1.1/D1.1M:2002; ANSI/AWS D14.3–94; BS EN 13000:2004; BS EN 14439:2006; ISO 11660–1:2008(E); ISO 11660–2:1994(E); ISO 11660–3:2008(E); PCSA Std. No. 2 (1968); SAE J185 (May 2003); SAE J987 (Jun. 2003); and SAE J1063 (Nov. 1993).” Therefore, the CA crane standard will adopt these new standards as indicated below.
(b) The materials listed in paragraphs (g) through (ff) of this section are incorporated by reference in the corresponding sections noted as they exist on the date of the approval, and a notice of any change in these materials will be published in the Federal Register. These incorporations by reference were approved by the Director of the Federal Register in		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
accordance with 5 U.S.C. 552(a) and 1 CFR part 51. (c) Copies of standards listed in this section and issued by private standards organizations are available for purchase from the issuing organizations at the addresses or through the other contact information listed below for these private standards organizations. In addition, these standards are available for inspection at the National Archives and Records Administration (NARA). For information on the availability of these standards at NARA, telephone: 202–741–6030, or go to http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html. Also, the standards are available for inspection at any Regional Office of the Occupational Safety and Health Administration (OSHA), or at the OSHA Docket Office, U.S. Department of Labor, 200 Constitution Avenue, NW., Room N–2625, Washington, DC 20210; telephone: 202–693–2350 (TTY number: 877–889–5627). (d) [Reserved.] (e) [Reserved.] (f) [Reserved.] (g) The following material is available for purchase from the American Conference of Governmental Industrial Hygienists (ACGIH), 1330 Kemper Meadow Drive, Cincinnati, OH 45240; telephone: 513–742–6163; fax: 513–742–3355; e-mail: mail@acgih.org; Web site: http://www.acgih.org:		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(1) Threshold Limit Values of Airborne Contaminants for 1970, 1970, IBR approved for § 1926.55(a) and Appendix A of § 1926.55. (h) The following material is available for purchase from the American National Standards Institute (ANSI), 25 West 43rd Street, Fourth Floor, New York, NY 10036; telephone: 212–642–4900; fax: 212–302–1286; e-mail: info@ansi.org; Web site: http://www.ansi.org/. (1) ANSI A10.3–1970, Safety Requirements for Explosive-Actuated Fastening Tools, IBR approved for § 1926.302(e). (2) ANSI A10.4–1963, Safety Requirements for Workmen's Hoists, IBR approved for § 1926.552(c). (3) ANSI A10.5–1969, Safety Requirements for Material Hoists, IBR approved for § 1926.552(b). (4) ANSI A11.1–1965 (R1970), Practice for Industrial Lighting, IBR approved for § 1926.56(b). (5) ANSI A17.1–1965, Elevators, Dumbwaiters, Escalators, and Moving Walks, IBR approved for § 1926.552(d). (6) ANSI A17.1a–1967, Elevators, Dumbwaiters, Escalators, and Moving Walks Supplement, IBR approved for § 1926.552(d). (7) ANSI A17.1b–1968, Elevators, Dumbwaiters, Escalators, and Moving Walks Supplement, IBR approved for § 1926.552(d). (8) ANSI A17.1c–1969, Elevators, Dumbwaiters, Escalators, and Moving Walks Supplement, IBR approved for § 1926.552(d).		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(9) ANSI A17.1d–1970, Elevators, Dumbwaiters, Escalators, and Moving Walks Supplement, IBR approved for § 1926.552(d). (10) ANSI A17.2–1960, Practice for the Inspection of Elevators (Inspector's Manual), IBR approved for § 1926.552(d). (11) ANSI A17.2a–1965, Practice for the Inspection of Elevators (Inspector's Manual) Supplement, IBR approved for § 1926.552(d). (12) ANSI A17.2b–1967, Practice for the Inspection of Elevators (Inspector's Manual) Supplement, IBR approved for § 1926.552(d). (13) ANSI A92.2–1969, Vehicle Mounted Elevating and Rotating Work Platforms, IBR approved for §§ 1926.453(a) and 1926.453(b). (14) ANSI B7.1–1970, Safety Code for the Use, Care, and Protection of Abrasive Wheels, IBR approved for §§ 1926.57(g), 1926.303(b), 1926.303(c), and 1926.303(d). (15) ANSI B20.1–1957, Safety Code for Conveyors, Cableways, and Related Equipment, IBR approved for § 1926.555(a). (16) ANSI B56.1–1969, Safety Standards for Powered Industrial Trucks, IBR approved for § 1926.602(c). (17) ANSI J6.1–1950 (R1971), Rubber Insulating Line Hose, IBR approved for § 1926.951(a). (18) ANSI J6.2–1950 (R1971), Rubber Insulating Hoods, IBR approved for § 1926.951(a). (19) ANSI J6.4–1971, Rubber Insulating Blankets, IBR approved for § 1926.951(a). (20) ANSI J6.5–1971, Rubber Insulating		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Sleeves, IBR approved for § 1926.951(a). (21) ANSI J6.6–1971, Rubber Insulating Gloves, IBR approved for § 1926.951(a). (22) ANSI J6.7–1935 (R1971), Rubber Matting for Use Around Electric Apparatus, IBR approved for § 1926.951(a). (23) ANSI O1.1–1961, Safety Code for Woodworking Machinery, IBR approved for § 1926.304(f). (24) ANSI Z35.1–1968, Specifications for Accident Prevention Signs, IBR approved for § 1926.200(i). (25) ANSI Z35.2–1968, Specifications for Accident Prevention Tags, IBR approved for § 1926.200(i). (26) ANSI Z49.1–1967, Safety in Welding and Cutting, IBR approved for § 1926.350(j). (27) ANSI Z87.1–1968, Practice for Occupational and Educational Eye and Face Protection, IBR approved for § 1926.102(a). (28) ANSI Z89.1–1969, Safety Requirements for Industrial Head Protection, IBR approved for § 1926.100(b). (29) ANSI Z89.2–1971, Industrial Protective Helmets for Electrical Workers, Class B, IBR approved for §§ 1926.100(c) and 1926.951(a). (i) [Reserved.] (j) The following material is available for purchase from the American Society for Testing and Materials (ASTM), ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428–2959; telephone: 610–832–9585; fax: 610–832–9555; e-mail: service@astm.org; Web site:		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
http://www.astm.org/: (1) ASTM A370–1968, Methods and Definitions for Mechanical Testing and Steel Products, IBR approved for § 1926.1001(f). (2) ASTM B117–1964, 50 Hour Test, IBR approved for § 1926.959(a). (3) ASTM D56–1969, Standard Method of Test for Flash Point by the Tag Closed Tester, IBR approved for § 1926.155(i). (4) ASTM D93–1969, Standard Method of Test for Flash Point by the Pensky Martens Closed Tester, IBR approved for § 1926.155(i). (5) ASTM D323–1958 (R1968), Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method), IBR approved for § 1926.155(m).		
(k) The following material is available for purchase from the American Society of Agricultural and Biological Engineers (ASABE), 2950 Niles Road, St. Joseph, MI 49085; telephone: 269–429–0300; fax: 269–429–3852; e-mail: hq@asabe.org; Web site: http://www.asabe.org/: (1) ASAE R313.1–1971, Soil Cone Penetrometer, reaffirmed 1975, IBR approved for § 1926.1002(e).		
(l) The following material is available for purchase from the American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016; telephone: 1–800–843–2763; fax: 973–882–1717; e-mail: infocentral@asme.org; Web site: http://www.asme.org/:	§4884.1. Design Standards. (d) Cranes and derricks manufactured after [Effective date] shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards which are hereby incorporated by reference:	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(1) **ASME B30.2–2005**, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist), issued Dec. 30, 2005 (''ASME B30.2–2005''), IBR approved for § 1926.1438(b). (2) **ASME B30.5–2004**, Mobile and Locomotive Cranes, issued Sept. 27, 2004 (''ASME B30.5–2004''), IBR approved for §§ 1926.1414(b); 1926.1414(e); 1926.1433(b). (3) **ASME B30.7–2001**, Base-Mounted Drum Hoists, issued Jan. 21, 2002 (''ASME B30.7–2001''), IBR approved for § 1926.1436(e). (4) **ASME B30.14–2004**, Side Boom Tractors, issued Sept. 20, 2004 (''ASME B30.14–2004''), IBR approved for § 1926.1440(c).	ASME B30.2–2005, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist), issued Dec. 30, 2005. B30.3-1996, Construction Tower Cranes (includes Hammerhead Tower Cranes) *[Ed note: feds did not update]* B30.4-1996, Portal, Tower and Pedestal *[Ed note: feds did not update]* ASME B30.5–2004, Mobile and Locomotive Cranes, issued Sept. 27, 2004. B30.6-1995, Derricks *[Ed note: feds did not update]* ASME B30.7–2001, Base-Mounted Drum Hoists, issued Jan. 21, 2002. B30.8-1982, Floating Cranes and Floating Derricks *[Ed note: feds did not update]* B30.11-1980, Monorails and Underhung Cranes *[Ed note: feds did not update]* B30.13-1977, Controlled Mechanical Storage Cranes *[Ed note: feds did not update]* ASME B30.14–2004, Side Boom Tractors, issued Sept. 20, 2004 B30.17-1992, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist).	
(5) ASME Boiler and Pressure Vessel Code, Section VIII, 1968, IBR approved for §§ 1926.152(i), 1926.306(a), and 1926.603(a). (6) ASME Power Boilers, Section I, 1968, IBR approved for § 1926.603(a).		
(m) The following material is available for purchase from the American Welding Society (AWS), 550 N.W. LeJeune Road, Miami,	§4884.1. Standards Incorporated by Reference. *** (d)(1) In addition, cranes and derricks	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Florida 33126; telephone: 1–800–443–9353; Web site: http://www.aws.org/: (1) **AWS D1.1/D1.1M:2002**, Structural Welding Code—Steel, 18th ed., ANSI approved Aug. 31, 2001 (''AWS D1.1/D1.1M:2002''), IBR approved for § 1926.1436(c). (2) **ANSI/AWS D14.3–94**, Specification for Welding Earthmoving and Construction Equipment, ANSI approved Jun. 11, 1993 (''ANSI/AWS D14.3–94''), IBR approved for § 1926.1436(c).	manufactured after [Effective date] shall be designed, constructed and installed in accordance with the following standards which are hereby incorporated by reference: (A) AWS D1.1/D1.1M:2002, Structural Welding Code—Steel, 18th ed., ANSI approved Aug. 31, 2001. (B) ANSI/AWS D14.3–94, Specification for Welding Earthmoving and Construction Equipment, ANSI approved Jun. 11, 1993.	
(n) The following material is available for purchase from the British Standards Institution (BSI), 389 Chiswick High Road, London, W4 4AL, United Kingdom; telephone: +44 20 8996 9001; fax: +44 20 8996 7001; e-mail: cservices@bsigroup.com; Web site: http://www.bsigroup.com/: (1) **BS EN 13000:2004**, Cranes—Mobile Cranes, published Jan. 4, 2006 (''BS EN 13000:2004''), IBR approved for § 1926.1433(c). (2) **BS EN 14439:2006**, Cranes—Safety—Tower Cranes, published Jan. 31, 2007 (''BS EN 14439:2006''), IBR approved for § 1926.1433(c).	§4884.1. Standards Incorporated by Reference. *** (d)(1) In addition, cranes and derricks manufactured after [Effective date] shall be designed, constructed and installed in accordance with the following standards which are hereby incorporated by reference: *** (C) BS EN 13000:2004, Cranes—Mobile Cranes, published Jan. 4, 2006. (D) BS EN 14439:2006, Cranes—Safety—Tower Cranes, published Jan. 31, 2007.	
(o) The following material is available for purchase from the Bureau of Reclamation, United States Department of the Interior, 1849 C Street, NW., Washington DC 20240; telephone: 202–208–4501; Web site:		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
http://www.usbr.gov/: (1) Safety and Health Regulations for Construction, Part II, Sept. 1971, IBR approved for § 1926.1000(f). (p) The following material is available for purchase from the California Department of Industrial Relations, 455 Golden Gate Avenue, San Francisco CA 94102; telephone: (415) 703–5070; email: info@dir.ca.gov; Web site: http://www.dir.ca.gov/: (1) Construction Safety Orders, IBR approved for § 1926.1000(f). (q) [Reserved.] (r) [Reserved.] (s) [Reserved.] (t) [Reserved.] (u) The following material is available for purchase from the Federal Highway Administration, United States Department of Transportation, 1200 New Jersey Ave., SE., Washington, DC 20590; telephone: 202–366–4000; Web site: http://www.fhwa.dot.gov/: (1) Manual on Uniform Traffic Control Devices, Millennium Edition, Dec. 2000, IBR approved for §§ 1926.200(g), 1926.201(a), and 1926.202. (v) The following material is available for purchase from the General Services Administration (GSA), 1800 F Street, NW., Washington, DC 20405; telephone: (202) 501–0800; Web site: http://www.gsa.gov/: (1) QQ–P–416, Federal Specification Plating Cadmium (Electrodeposited), IBR approved for § 1926.104(e). (w) The following material is available for		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
purchase from the Institute of Makers of Explosives (IME), 1120 19th Street, NW., Suite 310, Washington, DC 20036; telephone: 202–429–9280; fax: 202–429–9280; e-mail: info@ime.org; Web site: http://www.ime.org/: (1) IME Pub. No. 2, American Table of Distances for Storage of Explosives, Jun. 5, 1964, IBR approved for § 1926.914(a). (2) IME Pub. No. 20, Radio Frequency Energy—A Potential Hazard in the Use of Electric Blasting Caps, Mar. 1968, IBR approved for § 1926.900(k).		
(x) The following material is available for purchase from the International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, Case postale 56, CH–1211 Geneva 20, Switzerland; telephone: +41 22 749 01 11; fax: +41 22 733 34 30; Web site: http://www.iso.org/: (1) **ISO 11660–1:2008(E)**, Cranes—Access, guards and restraints—Part 1: General, 2d ed., Feb. 15, 2008 (''ISO 11660–1:2008(E)''), IBR approved for § 1926.1423(c). (2) **ISO 11660–2:1994(E)**, Cranes—Access, guards and restraints—Part 2: Mobile cranes, 1994 (''ISO 11660–2:1994(E)''), IBR approved for § 1926.1423(c). (3) **ISO 11660–3:2008(E)**, Cranes—Access, guards and restraints—Part 3: Tower cranes, 2d ed., Feb. 15, 2008 (''ISO 11660–3:2008(E)''), IBR approved for § 1926.1423(c).	§4884.1. Standards Incorporated by Reference. *** (d)(1) In addition, cranes and derricks manufactured after [Effective date] shall be designed, constructed and installed in accordance with the following standards which are hereby incorporated by reference: *** (E) ISO 11660–1:2008(E), Cranes—Access, guards and restraints—Part 1: General, 2d ed., Feb. 15, 2008. (F) ISO 11660–2:1994(E), Cranes—Access, guards and restraints—Part 2: Mobile cranes, 1994. (G) ISO 11660–3:2008(E), Cranes—Access, guards and restraints—Part 3: Tower cranes, 2d ed., Feb. 15, 2008.	
(y) The following material is available for purchase from the National Fire Protection		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169; telephone: 617–770–3000; fax: 617–770–0700; Web site: http://www.nfpa.org/: (1) NFPA 10A–1970, Maintenance and Use of Portable Fire Extinguishers, IBR approved for § 1926.150(c). (2) NFPA 13–1969, Standard for the Installation of Sprinkler Systems, IBR approved for § 1926.152(d). (3) NFPA 30–1969, The Flammable and Combustible Liquids Code, IBR approved for § 1926.152(c). (4) NFPA 80–1970, Standard for Fire Doors and Windows, Class E or F Openings, IBR approved for § 1926.152(b). (5) NFPA 251–1969, Standard Methods of Fire Test of Building Construction and Material, IBR approved for §§ 1926.152(b) and 1926.155(f). (6) NFPA 385–1966, Standard for Tank Vehicles for Flammable and Combustible Liquids, IBR approved for § 1926.152(g). (z) [Reserved.]		
(aa) The following material is available for purchase from the Power Crane and Shovel Association (PCSA), 6737 W. Washington Street, Suite 2400, Milwaukee, WI 53214; telephone: 1–800–369–2310; fax: 414–272–1170; Web site: http://www.aem.org/CBC/ProdSpec/PCSA/: (1) PCSA Std. No. 1, Mobile Crane and Excavator Standards, 1968, IBR approved for § 1926.602(b).	§4884.1. Standards Incorporated by Reference. *** (d)(1) In addition, cranes and derricks manufactured after [Effective date] shall be designed, constructed and installed in accordance with the following standards which are hereby incorporated by reference: ***	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(2) **PCSA Std. No. 2**, Mobile Hydraulic Crane Standards, 1968 (''PCSA Std. No. 2 (1968)''), IBR approved for §§ 1926.602(b), 1926.1433(a), and 1926.1501(a).	(H) PCSA Std. No. 2, Mobile Hydraulic Crane Standards, 1968.	Seat belts [addressed by 1926.602(b)] are covered by GISO 3653, and CSO sections 1591(h), 1596(a) and (g).
(3) PCSA Std. No. 3, Mobile Hydraulic Excavator Standards, 1969, IBR approved for § 1926.602(b).		
(bb) [Reserved.] (cc) [Reserved.]		
(dd) The following material is available for purchase from the Society of Automotive Engineers (SAE), 400 Commonwealth Drive, Warrendale, PA 15096; telephone: 1–877–606–7323; fax: 724–776–0790; Web site: http://www.sae.org/: (1) SAE 1970 Handbook, IBR approved for § 1926.602(b). (2) SAE 1971 Handbook, IBR approved for § 1926.1001(h). (3) SAE J166–1971, Trucks and Wagons, IBR approved for § 1926.602(a). (4) SAE J168–1970, Protective Enclosures—Test Procedures and Performance Requirements, IBR approved for § 1926.1002(a).	§4884.1. Standards Incorporated by Reference. *** (1) In addition, cranes and derricks manufactured after [Effective date] shall be designed, constructed and installed in accordance with the following standards which are hereby incorporated by reference: ***	
(5) **SAE J185 (reaf. May 2003)**, Access Systems for Off-Road Machines, reaffirmed May 2003 (''SAE J185 (May 1993)''), IBR approved for § 1926.1423(c). (6) SAE J236–1971, Self-Propelled Graders, IBR approved for § 1926.602(a). (7) SAE J237–1971, Front End Loaders and Dozers, IBR approved for § 126.602(a). (8) SAE J319b–1971, Self-Propelled Scrapers,	(I) SAE J185 (reaf. May 2003), Access Systems for Off-Road Machines, reaffirmed May 2003.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
IBR approved for § 1926.602(a). (9) SAE J320a–1971, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers, IBR approved for § 1926.1001(h). (10) SAE J321a–1970, Fenders for Pneumatic-Tired Earthmoving Haulage Equipment, IBR approved for § 1926.602(a). (11) SAE J333a–1970, Operator Protection for Agricultural and Light Industrial Tractors, IBR approved for § 1926.602(a).		
(11) SAE J386–1969, Seat Belts for Construction Equipment, IBR approved for § 1926.602(a).		T8, section 3653 references J386JUN93 and JUN85 standards
(12) SAE J394–1971, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front End Loaders and Robber-Tired Dozers, IBR approved for § 1926.1001(h). (13) SAE J395–1971, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders, IBR approved for § 1926.1001(h). (14) SAE J396–1971, Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders, IBR approved for § 1926.1001(h). (15) SAE J397–1969, Critical Zone Characteristics and Dimensions for Operators of Construction and Industrial Machinery, IBR approved for § 1926.1001(f). (16) SAE J743a–1964, Tractor Mounted Side Boom, 1964 (‘‘SAE J743a–1964’’), IBR		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
approved for § 1926.1501(a). (17) SAE J959–1966, Lifting Crane Wire-Rope Strength Factors, 1966 (''SAE J959–1966''), IBR approved for § 1926.1501(a).		
(18) **SAE J987 (rev. Jun. 2003)**, Lattice Boom Cranes—Method of Test, revised Jun. 2003 (''SAE J987 (Jun. 2003)''), IBR approved for § 1926.1433(c). (19) **SAE J1063 (rev. Nov. 1993)**, Cantilevered Boom Crane Structures—Method of Test, revised Nov. 1993 (''SAE J1063 (Nov. 1993)''), IBR approved for § 1926.1433(c).	(J) SAE J987 (rev. Jun. 2003), Lattice Boom Cranes—Method of Test, revised Jun. 2003. (K) SAE J1063 (rev. Nov. 1993), Cantilevered Boom Crane Structures—Method of Test, revised Nov. 1993.	
(ee) The following material is available for purchase from the United States Army Corps of Engineers, 441 G Street, NW., Washington, DC 20314; telephone: 202–761–0011; e-mail: hqpublicaffairs@usace.army.mil; Web site:http://www.usace.army.mil/: (1) EM–385–1–1, General Safety Requirements, Mar. 1967, IBR approved for § 1926.1000(f). (ff) The following material is available for purchase from standards resellers such as the Document Center Inc., 111 Industrial Road, Suite 9, Belmont, CA 94002; telephone: 650–591–7600; fax: 650–591–7617; e-mail: info@documentcenter.com; Web site: http://www.document-center.com/: (1) ANSI B15.1–1953 (R1958), Safety Code for Mechanical Power-Transmission Apparatus, revised 1958, IBR approved for §§ 1926.300(b)(2) and 1926.1501(a). (2) ANSI B30.2.0–1967, Safety Code for		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Overhead and Gantry Cranes, approved May 4, 1967, IBR approved for § 1926.1501(d). (3) ANSI B30.5–1968, Crawler, Locomotive, and Truck Cranes, approved Dec. 16, 1968, IBR approved for §§ 1926.1433(a), 1926.1501(a), and 1926.1501(b). (4) ANSI B30.6–1969, Safety Code for Derricks, approved Dec. 18, 1967, IBR approved for § 1926.1501(e).		
Subpart C—General Safety and Health Provisions		
3. The authority citation for subpart C of 29 CFR part 1926 is retained as follows: …		CA cites authority at each section.
§ 1926.31 [Reserved.] 4. Section 1926.31 is removed and reserved.		Section 1926.31, Incorporation by Reference, relocated to Subpart A, Section 1926.6. N/A for CA since CA cites authority at each section.
Subpart L—Scaffolds		
5. The authority citation for subpart L of 29 CFR part 1926 is revised to read as follows: …		CA cites authority at each section.
6. Section 1926.450 is amended by revising paragraph (a) to read as follows:		
§ 1926.450 Scope, application, and definitions applicable to this subpart. (a) *Scope and application.* This subpart applies to all scaffolds used in workplaces covered by this part. It does not apply to crane or derrick suspended personnel platforms. The criteria for aerial lifts are set out exclusively in § 1926.453.		Deletes reference to "…which are cove red by § 1926.550(g)." [Subpart N – Cranes, Derricks, Hoists, Elevators, and Conveyors] This is due to relocation of Cranes and Derricks to Subpart CC.
Subpart M—Fall Protection		
7. The authority citation for subpart M of 29 CFR part 1926 is revised to read as follows:…		CA cites authority at each section.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
8. Section 1926.500 is amended by revising paragraph (a)(2)(ii), adding paragraph (a)(3)(v), and revising paragraph (a)(4), to read as follows:		
§ 1926.500 Scope, application, and definitions applicable to this subpart. (a) * * * (2) * * * (ii) Requirements relating to fall protection for employees working on cranes and derricks are provided in subpart CC of this part. * * * * * (3) * * *		CA fall protection standards are horizontal.
(v) Criteria for steps, handholds, ladders, and grabrails/guardrails/railings required by subpart CC are provided in subpart CC. Sections 1926.502(a), (c) through (e), and (i) apply to activities covered under subpart CC unless otherwise stated in subpart CC. No other paragraphs of § 1926.502 apply to subpart CC. * * * * *		CA standards for stairs, ladders and guardrails are horizontal.
(4) Section 1926.503 sets forth requirements for training in the installation and use of fall protection systems, except in relation to steel erection activities and the use of equipment covered by subpart CC.		CA has horizontal training standards (which include fall protection) in Section 3203.
Subpart DD—Cranes and Derricks Used in Demolition and Underground Construction		CA Standards for cranes and derricks are contained in GISO Group 13.
9. New subpart DD, consisting of § 1926.1500 is added to read as follows:		
Subpart DD—Cranes and Derricks Used in Demolition and Underground Construction		
Authority: Section 3704 of the Contract Work		CA cites authority at each section.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Hours and Safety Standards Act (40 U.S.C. 3701); Sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order Nos. 12–71 (36 FR 8754), 8–76 (41 FR 25059), or 9–83 (49 FR 35736), and 5–2007 (72 FR 31159).		
§ 1926.1500 Scope. This subpart applies only to employers engaged in demolition work covered by § 1926.856 and § 1926.858, and underground construction work covered by § 1926.800. This subpart applies in lieu of § 1926 subpart CC.		CA standards for cranes are horizontal. See Section 4884, Scope.
Subpart N—Cranes, Derricks, Hoists, Elevators, and Conveyors		Formatting change not applicable to CA standards.
10. The authority citation for subpart N of 29 CFR part 1926 is revised to read as follows: …		CA cites authority at each section.
11. The heading to subpart N of 29 CFR part 1926 is revised to read as follows:		
Subpart N—Helicopters, Hoists, Elevators, and Conveyors * * * * *		Formatting change not applicable to CA standards.
§ 1926.550 [Redesignated as § 1926.1501]		
12. Section 1926.550 is redesignated as § 1926.1501 in subpart DD.		Formatting change not applicable to CA standards.
§ 1926.550 [Reserved]		
13. Section 1926.550 is reserved.		
14. Section 1926.553 is amended by adding paragraph (c) to read as follows: § 1926.553 Base-mounted drum hoists. * * * * * (c) This section does not apply to base-mounted drum hoists used in conjunction with derricks. Base-mounted drum hoists used in conjunction		CA has horizontal standards for hoists, found in GISO Article 97, Hoists, Auxiliary Hoisting Equipment and Hoisting Operation.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
with derricks must conform to § 1926.1436(e).		
Subpart O—Motorized Vehicles, Mechanical Equipment, and Marine Operations		
15. The authority citation for subpart O of 29 CFR part 1926 is revised to read as follows: …		CA cites authority at each section.
16. Section 1926.600 is amended by revising paragraph (a)(6) to read as follows:		
§ 1926.600 Equipment. (a) General Requirements. * * *	§5003. Provisions for Preventing Accidents in the Area of ~~High-Voltage~~ Power Lines or Energized Transmitters.	
(6) All equipment covered by this subpart shall comply with the following requirements when working or being moved in the vicinity of power lines or energized transmitters, except where electrical distribution and transmission lines have been deenergized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines:	(a) All equipment covered by Group 13 shall comply with the following requirements when working or being moved in the vicinity of power lines or energized transmitters, except where electrical distribution and transmission lines have been deenergized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines:	
(i) For lines rated 50 kV or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet;	(1) For lines rated 600 V or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet.	For voltages more than 600 V, see HVESO Sec. 2946, Table 2.
(ii) For lines rated over 50 kV, minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kV over 50 kV, or twice the length of the line insulator, but never less than 10 feet;	(2) For lines rated over 600 V, minimum clearance between the lines and any part of the crane or load shall be shall be in conformance with the High-Voltage Electrical Safety Orders, Article 37.	For voltages more than 600 V, see HVESO Sec. 2946, Table 2.
(iii) In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 50 kV, and 10 feet for voltages over 50 kV, up to and including 345 kV, and 16 feet for voltages up to and	(3) In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 600 V, 6 feet for voltages 600 V up to and including 50 kV, 10 feet for voltages over 50 kV, up to and	4 ft. clearance added for voltages below 600 V. Clearances for voltages 600 V and above are per Section 2946(b)(2) and Table 1.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
including 750 kV;	including 345 kV, 16 feet for voltages up to and including 750 kV; and 20 feet for voltages above 750,000 kV.	
(iv) A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means;	(4) A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.	
(v) Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation;	(5) Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other section of these Safety Orders even if such device is required by law or regulation.	
(vi) Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded;	§2946(d) Any overhead conductor shall be considered to be energized unless and until the person or electrical utility authority owning or operating such line verifies that the line is not energized, and the line is visibly grounded at the work site.	
(vii) Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages:	5003(6) Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages:	
(A) The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and	(A) The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and	
(B) Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while	(B) Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.	working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.	
(C) Combustible and flammable materials shall be removed from the immediate area prior to operations.	(C) Combustible and flammable materials shall be removed from the immediate area prior to operations.	
Subpart R—Steel Erection		CA counterpart is Title 8, Chapter 4, Subchapter 4, Construction Safety Orders, Section 1710.
17. The authority citation for subpart R of 29 CFR part 1926 is revised to read as follows: …		CA cites authority at each section.
18. Section 1926.753 is amended by revising paragraphs (a) and (c)(4) to read as follows:		
§ 1926.753 Hoisting and rigging. (a) All the provisions of subpart CC apply to hoisting and rigging with the exception of § 1926.1431(a). * * * * * (c) * * * (4) Cranes or derricks may be used to hoist employees on a personnel platform when work under this subpart is being conducted, provided that all provisions of § 1926.1431 (except for § 1926.1431(a)) are met. * * * * *		CA crane standards are horizontal. No need to amend Steel Erection. See CA counterpart for §1926.1431 to follow.
Subpart S—Underground Construction, Caissons, Cofferdams, and Compressed Air		CA counterpart is Title 8, Chapter 4, Subchapter 20, Tunnel Safety Orders.
19. The authority citation for subpart S of 29 CFR part 1926 is revised to read as follows: …		CA cites authority at each section.
20. Section 1926.800 is amended by revising		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
paragraph (t) to read as follows:		
§ 1926.800 Underground construction. * * * * * (t) Hoisting unique to underground construction. Employers must comply with § 1926.1501(g) of § 1926 subpart DD. Except as modified by this paragraph (t), the following provisions of subpart N of this part apply: Requirements for material hoists are found in §§ 1926.552(a) and (b) of this part. Requirements for personnel hoists are found in the personnel hoists requirements of §§ 1926.552(a) and (c) of this part and in the elevator requirement of §§ 1926.552(a) and (d) of this part. * * * * *		Formatting changes not applicable to CA standards, since CA crane standards are horizontal.
Subpart T—Demolition		
21. The authority citation for subpart S of 29 CFR part 1926 is revised to read as follows: …		CA cites authority at each section.
22. Section 1926.856 is amended by revising paragraph (c) to read as follows: § 1926.856 Removal of walls, floors, and material with equipment. * * * * * (c) Mechanical equipment used shall meet the requirements specified in subparts N and O and § 1926.1501 of § 1926 subpart DD.		Formatting changes not applicable to CA standards, since CA crane standards are horizontal.
23. Section 1926.858 is amended by revising paragraph (b) to read as follows: § 1926.858 Removal of walls, floors, and material with equipment. * * * * * (b) Cranes, derricks, and other hoisting		Formatting changes not applicable to CA standards, since CA crane standards are horizontal.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
equipment used shall meet the requirements specified in § 1926.1501 of § 1926 subpart DD.		
Subpart V—Power Transmission and Distribution		CA counterpart is Title 8, Chapter 4, Subchapter 5, Electrical Safety Orders, Group 2, High-Voltage Electrical Safety Orders.
24. The authority citation for subpart V of part 1926 is revised to read as follows: …		CA cites authority at each section.
25. Section 1926.952 is amended by revising paragraph (c) to read as follows: § 1926.952 Mechanical equipment. * * * * *		CA counterpart for 1926.952 is Title 8, Chapter 4, Subchapter 5, Group 2, High-Voltage Electrical Safety Orders, §2940.7. Note: CA Electrical Safety Orders apply both to construction and general industry.
(c) Cranes and other lifting equipment.	§2940.7(c) Derrick Trucks, Cranes and Other Lifting Equipment.	CA counterpart is High-Voltage Electrical Safety Orders, §2940.7(c)
(1) All equipment shall comply with subparts CC and O of this part, as applicable.		All Title 8 standards apply where applicable.
(2) Digger derricks used for augering holes for poles carrying electric lines, placing and removing poles, or for handling associated materials to be installed or removed from the poles must comply with 29 CFR 1910.269.		CA counterpart for §1910.269 is Title 8, Chapter 4, Subchapter 5, Group 2, High-Voltage Electrical Safety Orders (HVESO), and more specifically §2940.7(c) for digger derricks (see rows below). 29 CFR 1910.269 contains provisions for liveline-barehand work which have not been adopted by CA (CA does not allow liveline-barehand except by variance application).
	§2940.7(c) Derrick Trucks, Cranes and Other Lifting Equipment. ***	
(3) With the exception of equipment certified for work on the proper voltage, mechanical equipment shall not be operated closer to any energized line or equipment than the clearances	(2) With the exception of equipment certified for work on the proper voltage, mechanical equipment shall not be operated closer to any energized conductor or exposed energized parts	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
set forth in § 1926.950(c) unless, in addition to the requirements in § 1926.1410:	of equipment than the clearances set forth in Section 2940.2(b) Table 2940.2 unless, in addition to the requirements of Section 5003.3:	
	(A) an insulated barrier is installed between the energized part and the mechanical equipment, or	
(i) The mechanical equipment is insulated, or	(B) the mechanical equipment is insulated.	
(ii) The mechanical equipment is considered as energized. Note to paragraph (c)(3): In accordance with 29 CFR 1926.1400(g), compliance with 29 CFR 1910.269(p) will be deemed compliance with §§ 1926.1407 through 1926.1411, including § 1926.1410.		Not permitted in CA. Section 2940.7(c)(2) (shown above) is more protective than 1926.952(c)(3)(ii).
Subpart X—Stairways and Ladders	§1629. Stairways and Ladders.	
26. The authority citation for subpart X of 29 CFR part 1926 is amended by revising paragraph (a) to read as follows: …		CA cites authority at each section.
27. Section 1926.1050 is amended by revising paragraph (a) to read as follows:		
§ 1926.1050 Scope, application, and definitions applicable to this subpart.		
(a) Scope and application. This subpart applies to all stairways and ladders used in construction, alteration, repair (including painting and decorating), and demolition workplaces covered under 29 CFR part 1926, and also sets forth, in specified circumstances, when ladders and stairways are required to be provided. Additional requirements for ladders used on or with scaffolds are contained in subpart L—Scaffolds. This subpart does not apply to integral components of equipment	§1629(a) Scope and application. This section applies to all stairways and ladders used in construction, alteration, repair (including painting and decorating), and demolition workplaces covered under the Construction Safety Orders, and also sets forth, in specified circumstances, when ladders and stairways are required to be provided. Additional requirements for ladders used on or with scaffolds are contained in Article 21 – Scaffolds. This section does not apply to	This subject covered in CSO and GISO as indicated.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
covered by subpart CC. Subpart CC exclusively sets forth the circumstances when ladders and stairways must be provided on equipment covered by subpart CC.	integral components of equipment covered by General Industry Safety Orders, Group 13, Cranes and Other Hoisting Equipment which exclusively sets forth the circumstances when ladders and stairways shall be provided on equipment covered by those orders. **** §3234. Fixed Industrial Stairs. (a) Scope. This Section contains specifications for the safe design and construction of fixed general industrial stairs. This classification includes interior and exterior stairs around machinery, tanks, and other equipment, and stairs leading to or from floors, platforms, or pits. This Section does not apply to stairs used for required exit purposes, to construction operations, to integral components of equipment covered by Group 13 (Cranes and Other Hoisting Equipment), to private residences, or to articulated stairs, such as may be installed on floating roof tanks or on dock facilities, the angle of which changes with the rise and fall of the base support. ~~(Title 24, Part 2, Section 2-3326(a).)~~	
Appendix A to Part 1926—Designations for General Industry Standards Incorporated into Body of Construction Standards		
28. Appendix A to part 1926 is amended by removing the row containing ‘‘1926.550(a)(19)’’ and ‘‘1910.184(c)(9)’’ from the table ‘‘1926 DESIGNATIONS FOR		Formatting changes not applicable to CA standards.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
APPLICABLE 1910 STANDARDS.''		
Subparts AA and BB—[Reserved]		
29. Subparts AA and BB are reserved and subpart CC is added to read as follows:		Formatting changes not applicable to CA standards.
Subpart CC—Cranes and Derricks in Construction		CA counterpart is Title 8, Chapter 4, Subchapter 7, General Industry Safety Orders, Group 13, Cranes and Other Hoisting Equipment
Sec. 1926.1400 Scope. 1926.1401 Definitions. 1926.1402 Ground conditions. 1926.1403 Assembly/Disassembly—selection of manufacturer or employer procedures. 1926.1404 Assembly/Disassembly—general requirements (applies to all assembly and disassembly operations). 1926.1405 Disassembly—additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures). 1926.1406 Assembly/Disassembly—employer procedures—general requirements. 1926.1407 Power line safety (up to 350 kV)—assembly and disassembly. 1926.1408 Power line safety (up to 350 kV)—equipment operations. 1926.1409 Power line safety (over 350 kV). 1926.1410 Power line safety (all voltages)—equipment operations closer than the Table A zone. 1926.1411 Power line safety—while traveling.		Federal index.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
1926.1412 Inspections. 1926.1413 Wire rope—inspection. 1926.1414 Wire rope—selection and installation criteria. 1926.1415 Safety devices. 1926.1416 Operational aids. 1926.1417 Operation. 1926.1418 Authority to stop operation. 1926.1419 Signals—general requirements. 1926.1420 Signals—radio, telephone or other electronic transmission of signals. 1926.1421 Signals—voice signals—additional requirements. 1926.1422 Signals—hand signal chart. 1926.1423 Fall protection. 1926.1424 Work area control. 1926.1425 Keeping clear of the load. 1926.1426 Free fall and controlled load lowering. 1926.1427 Operator qualification and certification. 1926.1428 Signal person qualifications. 1926.1429 Qualifications of maintenance & repair employees. 1926.1430 Training. 1926.1431 Hoisting personnel. 1926.1432 Multiple-crane/derrick lifts—supplemental requirements. 1926.1433 Design, construction and testing. 1926.1434 Equipment modifications. 1926.1435 Tower cranes. 1926.1436 Derricks. 1926.1437 Floating cranes/derricks and land cranes/derricks on barges.		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
1926.1438 Overhead & gantry cranes. 1926.1439 Dedicated pile drivers. 1926.1440 Sideboom cranes. 1926.1441 Equipment with a rated hoisting/lifting capacity of 2,000 pounds or less. 1926.1442 Severability. Appendix A to Subpart CC of part 1926—Standard Hand Signals Appendix B to Subpart CC of part 1926—Assembly/Disassembly—Sample Procedures for Minimizing the Risk of Unintended Dangerous Boom Movement Appendix C to Subpart CC of part 1926—Operator Certification—Written Examination—Technical Knowledge Criteria		
Subpart CC—Cranes and Derricks in Construction	General Industry Safety Orders, Group 13, Cranes and Other Hoisting Equipment	CA Crane standards are horizontal – apply to both Construction and General Industry
§ 1926.1400 Scope.	§4884. Scope.	
(a) This standard applies to power operated equipment, when used in construction, that can hoist, lower and horizontally move a suspended load. Such equipment includes, but is not limited to: Articulating cranes (such as knuckle-boom cranes); crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes); multi-purpose machines when configured to hoist and lower	(a) The Orders in this Group shall apply to ~~derricks, cranes, and boom-type excavators, but they shall not apply to aerial devices designed and used for positioning personnel (See Article 24).~~ power operated equipment, that can hoist, lower and horizontally move a suspended load. Such equipment includes, but is not limited to: Articulating cranes (such as knuckle-boom cranes); crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes); multi-purpose machines when configured to hoist and lower (by means of a	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(by means of a winch or hook) and horizontally move a suspended load; industrial cranes (such as carry-deck cranes); dedicated pile drivers; service/mechanic trucks with a hoisting device; a crane on a monorail; tower cranes (such as a fixed jib, i.e., ''hammerhead boom''), luffing boom and self-erecting); pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; sideboom cranes; derricks; and variations of such equipment. However, items listed in paragraph (c) of this section are excluded from the scope of this standard.	winch or hook) and horizontally move a suspended load; industrial cranes (such as carry-deck cranes); dedicated pile drivers; service/mechanic trucks with a hoisting device; a crane on a monorail; tower cranes (such as a fixed jib, i.e., "hammerhead boom"), luffing boom and self-erecting; pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; sideboom cranes; derricks; and variations of such equipment. However, items listed in subsection (c) are excluded from the scope of this standard.	
(b) Attachments. This standard applies to equipment included in paragraph (a) of this section when used with attachments. Such attachments, whether crane-attached or suspended include, but are not limited to: Hooks, magnets, grapples, clamshell buckets, orange peel buckets, concrete buckets, drag lines, personnel platforms, augers or drills and pile driving equipment.	(b) Attachments. This standard applies to equipment included in subsection (a) when used with attachments. Such attachments, whether crane-attached or suspended include, but are not limited to: Hooks, magnets, grapples, clamshell buckets, orange peel buckets, concrete buckets, drag lines, personnel platforms, augers or drills and pile driving equipment.	
(c) Exclusions. This subpart does not cover: (1) Machinery included in paragraph (a) of this section while it has been converted or adapted for a non-hoisting/lifting use. Such conversions/adaptations include, but are not limited to, power shovels, excavators and concrete pumps. (2) Power shovels, excavators, wheel loaders, backhoes, loader backhoes, track loaders. This machinery is also excluded when used with chains, slings or other rigging to lift suspended loads. (3) Automotive wreckers and tow trucks when	(c) Exclusions. This Group 13 does not cover: (1) Machinery included in subsection (a) while it has been converted or adapted for a non-hoisting/lifting use. Such conversions/adaptations include, but are not limited to, power shovels, excavators and concrete pumps. (2) Power shovels, excavators, wheel loaders, backhoes, loader backhoes, track loaders. This machinery is also excluded when used with chains, slings or other rigging to lift suspended loads. (3) Automotive wreckers and tow trucks when	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
used to clear wrecks and haul vehicles.	used to clear wrecks and haul vehicles.	
(4) Digger derricks when used for augering holes for poles carrying electric and telecommunication lines, placing and removing the poles, and for handling associated materials to be installed on or removed from the poles. Digger derricks used in work subject to 29 CFR part 1926, subpart V, must comply with 29 CFR 1910.269. Digger derricks used in construction work for telecommunication service (as defined at 29 CFR 1910.268(s)(40)) must comply with 29 CFR 1910.268.	(4) Digger derricks when used for augering holes for poles carrying electric and telecommunication lines, placing and removing the poles, and for handling associated materials to be installed on or removed from the poles. (A) Digger derricks used in work subject to The Electrical Safety Orders shall comply with Section 2940.7 of those Safety Orders. (B) Digger derricks used in construction work for telecommunication service (as defined in the Telecommunication Safety Orders) shall comply with those Safety Orders.	The ESO and TCSO correspond to 1926 subpart Part V and with 1910.268 respectively.
(5) Machinery originally designed as vehicle-mounted aerial devices (for lifting personnel) and self-propelled elevating work platforms. (6) Telescopic/hydraulic gantry systems. (7) Stacker cranes. (8) Powered industrial trucks (forklifts), except when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load.	(5) Machinery originally designed as vehicle-mounted aerial devices (for lifting personnel) and self-propelled elevating work platforms. (6) Telescopic/hydraulic gantry systems. (7) Stacker cranes. (8) Powered industrial trucks (forklifts), except when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load.	
(9) Mechanic's truck with a hoisting device when used in activities related to equipment maintenance and repair.	(9) Mechanic's truck with a hoisting device when used in activities related to equipment maintenance and repair.	
(10) Machinery that hoists by using a come-a-long or chainfall. (11) Dedicated drilling rigs. (12) Gin poles when used for the erection of communication towers.	(10) Machinery that hoists by using a come-a-long or chainfall. (11) Dedicated drilling rigs. (12) Gin poles when used for the erection of communication towers.	
(13) Tree trimming and tree removal work.		California is more protective; i.e., crane operators for tree trimming and removal are currently required to be certified. Use of cranes for tree trimming and removal is covered under

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
		GISO Article 12, Section 3427.
(14) Anchor handling or dredge related operations with a vessel or barge using an affixed A-frame. (15) Roustabouts. (16) Helicopter cranes.	(13) Anchor handling or dredge related operations with a vessel or barge using an affixed A-frame. (14) Roustabouts. (15) Helicopter cranes.	
(17) Material Delivery (i) Articulating/knuckle-boom truck cranes that deliver material to a construction site when used to transfer materials from the truck crane to the ground, without arranging the materials in a particular sequence for hoisting. (ii) Articulating/knuckle-boom truck cranes that deliver material to a construction site when the crane is used to transfer building supply sheet goods or building supply packaged materials from the truck crane onto a structure, using a fork/cradle at the end of the boom, but only when the truck crane is equipped with a properly functioning automatic overload prevention device. Such sheet goods or packaged materials include, but are not limited to: Sheets of sheet rock, sheets of plywood, bags of cement, sheets or packages of roofing shingles, and rolls of roofing felt. (iii) This exclusion does not apply when: (A) The articulating/knuckle-boom crane is used to hold, support or stabilize the material to facilitate a construction activity, such as holding material in place while it is attached to the structure; (B) The material being handled by the articulating/knuckle-boom crane is a prefabricated component. Such prefabricated		California does not permit exclusions for articulating/knuckle-boom cranes.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
components include, but are not limited to: Precast concrete members or panels, roof trusses (wooden, cold-formed metal, steel, or other material), prefabricated building sections such as, but not limited to: Floor panels, wall panels, roof panels, roof structures, or similar items; (C) The material being handled by the crane is a structural steel member (for example, steel joists, beams, columns, steel decking (bundled or unbundled) or a component of a systems-engineered metal building (as defined in 29 CFR 1926 subpart R). (D) The activity is not specifically excluded under § 1400(c)(17)(i) and (ii).		
(d) All sections of this subpart CC apply to the equipment covered by this standard unless specified otherwise.	4884.2(f) All sections of Group 13 apply to the equipment covered by this standard unless specified otherwise.	
(e) The duties of controlling entities under this subpart include, but are not limited to, the duties specified in § 1926.1402(c), § 1926.1402(e) and § 1926.1424(b).		This subsection is redundant and unnecessary.
(f) Where provisions of this standard direct an operator, crewmember, or other employee to take certain actions, the employer must establish, effectively communicate to the relevant persons, and enforce, work rules to ensure compliance with such provisions.		Employer responsibilities are covered by Section 3203.
(g) For work covered by subpart V of this part, compliance with 29 CFR § 1910.269(p) is deemed compliance with §§ 1926.1407 through 1926.1411.	4884.2(d) For work covered by the High-Voltage Electrical Safety Orders, compliance with those Orders is deemed compliance with §§4991.2, 4992.3, 5003.1, 5003.2, and 5003.3.	
(h) Section 1926.1402 does not apply to cranes designed for use on railroad tracks, when used	4884.2(e) Section 4991.1 does not apply to cranes designed for use on railroad tracks,	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213, and that comply with applicable Federal Railroad Administration requirements. See §1926.1402(f).	when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213, and that comply with applicable Federal Railroad Administration requirements. See §4991.1(f).	
§ 1926.1401 Definitions.	§4885. Definitions.	
A/D director (Assembly/Disassembly director) means an individual who meets this subpart's requirements for an A/D director, irrespective of the person's formal job title or whether the person is non-management or management personnel.	A/D Director (Assembly/Disassembly Director). An individual who meets this section's requirements for an A/D director, irrespective of the person's formal job title or whether the person is non-management or management personnel.	
Articulating crane means a crane whose boom consists of a series of folding, pin connected structural members, typically manipulated to extend or retract by power from hydraulic cylinders.	Articulating Boom Crane. A crane ~~articulated by hydraulic cylinders, powered by an internal combustion engine or electric motor.~~ whose boom consists of a series of folding, pin connected structural members, typically manipulated to extend or retract by power from hydraulic cylinders.	
Assembly/Disassembly means the assembly and/or disassembly of equipment covered under this standard. With regard to tower cranes, ''erecting and climbing'' replaces the term ''assembly,'' and ''dismantling'' replaces the term ''disassembly.'' Regardless of whether the crane is initially erected to its full height or is climbed in stages, the process of increasing the height of the crane is an erection process.	Assembly/Disassembly. The assembly and/or disassembly of equipment covered under this standard. With regard to tower cranes, ''erecting and climbing'' replaces the term ''assembly,'' and ''dismantling'' replaces the term ''disassembly.'' Regardless of whether the crane is initially erected to its full height or is climbed in stages, the process of increasing the height of the crane is an erection process.	
Assist crane means a crane used to assist in assembling or disassembling a crane.	Assist Crane. A crane used to assist in assembling or disassembling a crane.	
Attachments means any device that expands the	Attachment(s). Any device that expands the	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
range of tasks that can be done by the equipment. Examples include, but are not limited to: An auger, drill, magnet, pile-driver, and boom-attached personnel platform.	range of tasks that can be done by the equipment. Examples include, but are not limited to: An auger, drill, magnet, pile-driver, and boom-attached personnel platform.	
Audible signal means a signal made by a distinct sound or series of sounds. Examples include, but are not limited to, sounds made by a bell, horn, or whistle.	Audible Signal. A signal made by a distinct sound or series of sounds. Examples include, but are not limited to, sounds made by a bell, horn, or whistle.	
Blocking (also referred to as ‘‘cribbing’’) is wood or other material used to support equipment or a component and distribute loads to the ground. It is typically used to support lattice boom sections during assembly/ disassembly and under outrigger and stabilizer floats.	Blocking (also referred to as “cribbing”) is wood or other material used to support equipment or a component and distribute loads to the ground. It is typically used to support lattice boom sections during assembly/ disassembly and under outrigger and stabilizer floats.	
Boatswain’s chair means a single-point adjustable suspension scaffold consisting of a seat or sling (which may be incorporated into a full body harness) designed to support one employee in a sitting position.	Boatswain’s Chair. A single-point adjustable suspension scaffold consisting of a seat or sling (which may be incorporated into a full body harness) designed to support one employee in a sitting position.	
Bogie means ‘‘travel bogie,’’ which is defined below.	Bogie means “travel bogie,” which is defined below.	
	Boom. A member section of a crane or derrick, the lower end of which is affixed to a mast, base, carriage, or support, and the upper end supports a hook or other end attachment. The length of the boom shall be taken as the straight line distance between the axis of the foot pin and the axis of the end sheave pin.	
Boom (equipment other than tower crane) means an inclined spar, strut, or other long structural member which supports the upper hoisting tackle on a crane or derrick. Typically, the length and vertical angle of the boom can be	Boom (equipment other than tower crane). An inclined spar, strut, or other long structural member which supports the upper hoisting tackle on a crane or derrick. Typically, the length and vertical angle of the boom can be	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
varied to achieve increased height or height and reach when lifting loads. Booms can usually be grouped into general categories of hydraulically extendible, cantilevered type, latticed section, cable supported type or articulating type.	varied to achieve increased height or height and reach when lifting loads. Booms can usually be grouped into general categories of hydraulically extendible, cantilevered type, latticed section, cable supported type or articulating type.	
Boom (tower cranes): On tower cranes, if the ''boom'' (i.e., principal horizontal structure) is fixed, it is referred to as a jib; if it is moveable up and down, it is referred to as a boom.	Boom (tower cranes): On tower cranes, if the ''boom'' (i.e., principal horizontal structure) is fixed, it is referred to as a jib; if it is moveable up and down, it is referred to as a boom.	
Boom angle indicator means a device which measures the angle of the boom relative to horizontal.	Boom angle indicator. A device which measures the angle of the boom relative to horizontal.	
Boom hoist limiting device includes boom hoist disengaging device, boom hoist shut-off, boom hoist disconnect, boom hoist hydraulic relief, boom hoist kick-outs, automatic boom stop device, or derricking limiter. This type of device disengages boom hoist power when the boom reaches a predetermined operating angle. It also sets brakes or closes valves to prevent the boom from lowering after power is disengaged.	Boom hoist limiting device includes boom hoist disengaging device, boom hoist shut-off, boom hoist disconnect, boom hoist hydraulic relief, boom hoist kick-outs, automatic boom stop device, or derricking limiter. This type of device disengages boom hoist power when the boom reaches a predetermined operating angle. It also sets brakes or closes valves to prevent the boom from lowering after power is disengaged.	
Boom length indicator indicates the length of the permanent part of the boom (such as ruled markings on the boom) or, as in some computerized systems, the length of the boom with extensions/attachments.	Boom length indicator indicates the length of the permanent part of the boom (such as ruled markings on the boom) or, as in some computerized systems, the length of the boom with extensions/attachments.	
Boom stop includes boom stops, (belly straps with struts/standoff), telescoping boom stops, attachment boom stops, and backstops. These devices restrict the boom from moving above a certain maximum angle and toppling over backward.	Boomstop. ~~A device used to limit the angle of the boom at the highest position.~~ Boom stop includes boom stops, (belly straps with struts/standoff), telescoping boom stops, attachment boom stops, and backstops. These devices restrict the boom from moving above a certain maximum angle and toppling over	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	backward.	
Boom suspension system means a system of pendants, running ropes, sheaves, and other hardware which supports the boom tip and controls the boom angle.	Boom suspension system. A system of pendants, running ropes, sheaves, and other hardware which supports the boom tip and controls the boom angle.	
Builder means the builder/constructor of equipment.	Builder. The builder/constructor of equipment.	
Center of gravity: The center of gravity of any object is the point in the object around which its weight is evenly distributed. If you could put a support under that point, you could balance the object on the support.	Center of gravity: The center of gravity of any object is the point in the object around which its weight is evenly distributed. If you could put a support under that point, you could balance the object on the support.	
	Certificating Agency. Certificating agencies are qualified agencies, and/or persons, licensed by the Division to examine, test and certify cranes and derricks in accordance with Sections 344.60 through 344.67 of Title 8 of the California Code of Regulations.	These existing CA definitions are provided for convenience of the federal reviewer (they are used extensively in inspection and testing standards).
	Certified Agent. The manufacturer, or a person who is currently registered as a professional civil, mechanical, or structural engineer by the State of California and is knowledgeable in the structure and use of the equipment.	These existing CA definitions are provided for convenience of the federal reviewer (they are used extensively in inspection and testing standards).
Certified welder means a welder who meets nationally recognized certification requirements applicable to the task being performed.	Certified welder. A welder who meets nationally recognized certification requirements applicable to the task being performed.	
Climbing means the process in which a tower crane is raised to a new working height, either by adding additional tower sections to the top of the crane (top climbing), or by a system in which the entire crane is raised inside the structure (inside climbing).	Climbing. The process in which a tower crane is raised to a new working height, either by adding additional tower sections to the top of the crane (top climbing), or by a system in which the entire crane is raised inside the structure (inside climbing).	
Come-a-long means a mechanical device typically consisting of a chain or cable attached	Come-a-long. A mechanical device typically consisting of a chain or cable attached at each	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
at each end that is used to facilitate movement of materials through leverage.	end that is used to facilitate movement of materials through leverage.	
Competent person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.	Competent person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.	
Controlled load lowering means lowering a load by means of a mechanical hoist drum device that allows a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist mechanism. Controlled load lowering requires the use of the hoist drive motor, rather than the load hoist brake, to lower the load.	Controlled load lowering. Lowering a load by means of a mechanical hoist drum device that allows a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist mechanism. Controlled load lowering requires the use of the hoist drive motor, rather than the load hoist brake, to lower the load.	
Controlling entity means an employer that is a prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the project—its planning, quality and completion.	Controlling entity. An employer that is a prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the project—its planning, quality and completion.	
Counterweight means a weight used to supplement the weight of equipment in providing stability for lifting loads by counterbalancing those loads.	Counterweight. A weight used to supplement the weight of the machine in providing stability for lifting working loads by counterbalancing those loads.	
Crane/derrick includes all equipment covered by this subpart.	Crane. A machine for lifting or lowering a load and moving it horizontally, in which the hoisting mechanism is an integral part of the machine. It may be driven manually or by power and may be a fixed or a mobile machine, but does not include stackers, lift trucks, power shovels, backhoes, or excavators. Some of the common types of cranes are defined as follows:	Items struck from existing T8 definition are because exclusions will now be covered under Section 4884, Scope. Derrick is defined by Section 4885 as: "An apparatus consisting of a mast or equivalent member held at the top by guys or braces, with or without a boom, for use with a

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	*****	hoisting mechanism and operating rope, for lifting or lowering a load and moving it horizontally."
Crawler crane means equipment that has a type of base mounting which incorporates a continuous belt of sprocket driven track.	(C) Crawler Crane. A crane consisting of a superstructure with power plant, operating machinery and boom, mounted on a base, equipped with crawler treads for travel.	Existing T8 definition for "Crawler Crane"
Crossover points means locations on a wire rope which is spooled on a drum where one layer of rope climbs up on and crosses over the previous layer. This takes place at each flange of the drum as the rope is spooled onto the drum, reaches the flange, and begins to wrap back in the opposite direction.	Crossover points. Locations on a wire rope which is spooled on a drum where one layer of rope climbs up on and crosses over the previous layer. This takes place at each flange of the drum as the rope is spooled onto the drum, reaches the flange, and begins to wrap back in the opposite direction.	
Dedicated channel means a line of communication assigned by the employer who controls the communication system to only one signal person and crane/derrick or to a coordinated group of cranes/derricks/signal person(s).	Dedicated channel. A line of communication assigned by the employer who controls the communication system to only one signal person and crane/derrick or to a coordinated group of cranes/derricks/signal person(s).	
Dedicated pile-driver is a machine that is designed to function exclusively as a pile-driver. These machines typically have the ability to both hoist the material that will be pile-driven and to pile-drive that material.	Dedicated pile-driver is a machine that is designed to function exclusively as a pile-driver. These machines typically have the ability to both hoist the material that will be pile-driven and to pile-drive that material.	
Dedicated spotter (power lines): To be considered a dedicated spotter, the requirements of § 1926.1428 (Signal person qualifications) must be met and his/her sole responsibility is to watch the separation between the power line and the equipment, load line and load (including rigging and lifting accessories), and ensure through communication with the operator that the	Dedicated spotter (power lines): To be considered a dedicated spotter, the requirements of §5001.3 (Signal person qualifications) must be met and his/her sole responsibility is to watch the separation between the power line and the equipment, load line and load (including rigging and lifting accessories), and ensure through communication with the operator that the	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
applicable minimum approach distance is not breached.	applicable minimum approach distance is not breached.	
Directly under the load means a part or all of an employee is directly beneath the load.	Directly under the load. A part or all of an employee is directly beneath the load.	
Dismantling includes partial dismantling (such as dismantling to shorten a boom or substitute a different component).	Dismantling includes partial dismantling (such as dismantling to shorten a boom or substitute a different component).	
Drum rotation indicator means a device on a crane or hoist which indicates in which direction and at what relative speed a particular hoist drum is turning.	Drum rotation indicator. A device on a crane or hoist which indicates in which direction and at what relative speed a particular hoist drum is turning.	
Electrical contact occurs when a person, object, or equipment makes contact or comes in close proximity with an energized conductor or equipment that allows the passage of current.	Electrical contact occurs when a person, object, or equipment makes contact or comes in close proximity with an energized conductor or equipment that allows the passage of current.	
Employer-made equipment means floating cranes/derricks designed and built by an employer for the employer's own use.	Employer-made equipment means floating cranes/derricks designed and built by an employer for the employer's own use.	
Encroachment is where any part of the crane, load line or load (including rigging and lifting accessories) breaches a minimum clearance distance that this subpart requires to be maintained from a power line.	Encroachment is where any part of the crane, load line or load (including rigging and lifting accessories) breaches a minimum clearance distance that this Group 13 requires to be maintained from a power line.	
Equipment means equipment covered by this subpart.		Unnecessary, and may actually result in less effective standard since it restricts the definition of "equipment."
Equipment criteria means instructions, recommendations, limitations and specifications.	Equipment criteria means instructions, recommendations, limitations and specifications.	
Fall protection equipment means guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.	Fall protection equipment. Guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.	Fall protection is more thoroughly described in CSO Article 24.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Fall restraint system means a fall protection system that prevents the user from falling any distance. The system is comprised of either a body belt or body harness, along with an anchorage, connectors and other necessary equipment. The other components typically include a lanyard, and may also include a lifeline and other devices.	Fall restraint system. A fall protection system that prevents the user from falling any distance. The system is comprised of either a body belt or body harness, along with an anchorage, connectors and other necessary equipment. The other components typically include a lanyard, and may also include a lifeline and other devices.	
Fall zone means the area (including but not limited to the area directly beneath the load) in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.	Fall zone. The area (including but not limited to the area directly beneath the load) in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.	
Flange points are points of contact between rope and drum flange where the rope changes layers.	Flange points are points of contact between rope and drum flange where the rope changes layers.	
Floating cranes/derricks means equipment designed by the manufacturer (or employer) for marine use by permanent attachment to a barge, pontoons, vessel or other means of flotation.	Floating cranes/derricks. Equipment designed by the manufacturer (or employer) for marine use by permanent attachment to a barge, pontoons, vessel or other means of flotation.	
For example means ‘‘one example, although there are others.’’	For example means “one example, although there are others.”	
Free fall (of the load line) means that only the brake is used to regulate the descent of the load line (the drive mechanism is not used to drive the load down faster or retard its lowering).	Free fall (of the load line) means that only the brake is used to regulate the descent of the load line (the drive mechanism is not used to drive the load down faster or retard its lowering).	
Free surface effect is the uncontrolled transverse movement of liquids in compartments which reduce a vessel’s transverse stability.	Free surface effect is the uncontrolled transverse movement of liquids in compartments which reduce a vessel’s transverse stability.	
Hoist means a mechanical device for lifting and lowering loads by winding a line onto or off a drum.	Hoist. A mechanical device for lifting and lowering loads by winding a line onto or off a drum. ~~An apparatus for raising or lowering a load by the application of a pulling force, but~~	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	~~does not include a car or platform riding in guides.~~ Some common types of hoists are defined as follows:	
Hoisting is the act of raising, lowering or otherwise moving a load in the air with equipment covered by this standard. As used in this standard, ''hoisting'' can be done by means other than wire rope/hoist drum equipment.		This definition could be problematic for enforcing crane and derrick standards on hoists that pull conveyances up an incline. These conveyances are not covered elsewhere in T8, therefore we decline to adopt this definition.
Include/including means ''including, but not limited to.''	Include/including means "including, but not limited to."	
Insulating link/device means an insulating device listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.	Insulating link/device. An insulating device listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.	
Jib stop (also referred to as a jib backstop), is the same type of device as a boom stop but is for a fixed or luffing jib.	Jib stop (also referred to as a jib backstop), is the same type of device as a boom stop but is for a fixed or luffing jib.	
Land crane/derrick is equipment not originally designed by the manufacturer for marine use by permanent attachment to barges, pontoons, vessels, or other means of floatation.	Land crane/derrick is equipment not originally designed by the manufacturer for marine use by permanent attachment to barges, pontoons, vessels, or other means of floatation.	
List means the angle of inclination about the longitudinal axis of a barge, pontoons, vessel or other means of floatation.	List. The angle of inclination about the longitudinal axis of a barge, pontoons, vessel or other means of floatation.	
Load refers to the object(s) being hoisted and/or the weight of the object(s); both uses refer to the object(s) and the load-attaching equipment, such as, the load block, ropes, slings, shackles, and any other ancillary attachment.	Load ~~(Working). The external load in pounds applied on the hoisting line, including the weight of load attaching equipment such as load blocks, shackles, slings, buckets, and magnets.~~ refers to the object(s) being hoisted and/or the weight of the object(s); both uses refer to the object(s) and the load-attaching equipment, such as, the load block, ropes, slings, shackles, and any other ancillary attachment.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Load moment (or rated capacity) indicator means a system which aids the equipment operator by sensing (directly or indirectly) the overturning moment on the equipment, i.e., load multiplied by radius. It compares this lifting condition to the equipment's rated capacity, and indicates to the operator the percentage of capacity at which the equipment is working. Lights, bells, or buzzers may be incorporated as a warning of an approaching overload condition.	Load moment (or rated capacity) indicator. A system which aids the equipment operator by sensing (directly or indirectly) the overturning moment on the equipment, i.e., load multiplied by radius. It compares this lifting condition to the equipment's rated capacity, and indicates to the operator the percentage of capacity at which the equipment is working. Lights, bells, or buzzers may be incorporated as a warning of an approaching overload condition.	
Load moment (or rated capacity) limiter means a system which aids the equipment operator by sensing (directly or indirectly) the overturning moment on the equipment, i.e., load multiplied by radius. It compares this lifting condition to the equipment's rated capacity, and when the rated capacity is reached, it shuts off power to those equipment functions which can increase the severity of loading on the equipment, e.g., hoisting, telescoping out, or luffing out. Typically, those functions which decrease the severity of loading on the equipment remain operational, e.g., lowering, telescoping in, or luffing in.	Load moment (or rated capacity) limiter. A system which aids the equipment operator by sensing (directly or indirectly) the overturning moment on the equipment, i.e., load multiplied by radius. It compares this lifting condition to the equipment's rated capacity, and when the rated capacity is reached, it shuts off power to those equipment functions which can increase the severity of loading on the equipment, e.g., hoisting, telescoping out, or luffing out. Typically, those functions which decrease the severity of loading on the equipment remain operational, e.g., lowering, telescoping in, or luffing in.	
Locomotive crane means a crane mounted on a base or car equipped for travel on a railroad track.	Locomotive crane. A crane mounted on a base or car equipped for travel on a railroad track.	
Luffing jib limiting device is similar to a boom hoist limiting device, except that it limits the movement of the luffing jib.	Luffing jib limiting device is similar to a boom hoist limiting device, except that it limits the movement of the luffing jib.	
Marine hoisted personnel transfer device means a device, such as a ''transfer net,'' that is designed to protect the employees being hoisted	Marine hoisted personnel transfer device. A device, such as a ''transfer net,'' that is designed to protect the employees being hoisted	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
during a marine transfer and to facilitate rapid entry into and exit from the device. Such devices do not include boatswain's chairs when hoisted by equipment covered by this standard.	during a marine transfer and to facilitate rapid entry into and exit from the device. Such devices do not include boatswain's chairs when hoisted by equipment covered by this standard.	
Marine worksite means a construction worksite located in, on or above the water.	Marine worksite. A construction worksite located in, on or above the water.	
Mobile crane means a lifting device incorporating a cable suspended latticed boom or hydraulic telescopic boom designed to be moved between operating locations by transport over the road.	Mobile crane. A lifting device incorporating a cable suspended latticed boom or hydraulic telescopic boom designed to be moved between operating locations by transport over the road.	
Moving point-to-point means the times during which an employee is in the process of going to or from a work station.	Moving point-to-point means the times during which an employee is in the process of going to or from a work station.	
Multi-purpose machine means a machine that is designed to be configured in various ways, at least one of which allows it to hoist (by means of a winch or hook) and horizontally move a suspended load. For example, a machine that can rotate and can be configured with removable forks/tongs (for use as a forklift) or with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch. When configured with the forks/tongs, it is not covered by this subpart. When configured with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch, it is covered by this subpart.	Multi-purpose machine. A machine that is designed to be configured in various ways, at least one of which allows it to hoist (by means of a winch or hook) and horizontally move a suspended load. For example, a machine that can rotate and can be configured with removable forks/tongs (for use as a forklift) or with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch. When configured with the forks/tongs, it is not covered by this standard. When configured with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch, it is covered by this standard.	
Nationally recognized accrediting agency is an organization that, due to its independence and expertise, is widely recognized as competent to	§5006.1. Mobile Crane and Tower Crane-Operator Qualifications and Certification. *** (c) Accredited Certifying Entity. A certifying entity is any organization whose certification program is accredited by either the National	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
accredit testing organizations. Examples of such accrediting agencies include, but are not limited to, the National Commission for Certifying Agencies and the American National Standards Institute.	Commission for Certifying Agencies (NCCA), or the American National Standards Institute (ANSI). ANSI accreditation shall be in accordance with the requirements of the ANSI, International Organization for Standardization (ISO), International Electrotechnical Commission (IEC) 17024:2003(E), Conformity Assessment-General Requirements for Bodies Operating Certification of Persons, which is hereby incorporated by reference.	
Nonconductive means that, because of the nature and condition of the materials used, and the conditions of use (including environmental conditions and condition of the material), the object in question has the property of not becoming energized (that is, it has high dielectric properties offering a high resistance to the passage of current under the conditions of use).	Nonconductive means that, because of the nature and condition of the materials used, and the conditions of use (including environmental conditions and condition of the material), the object in question has the property of not becoming energized (that is, it has high dielectric properties offering a high resistance to the passage of current under the conditions of use).	
Operational aids are devices that assist the operator in the safe operation of the crane by providing information or automatically taking control of a crane function. These include, but are not limited to, the devices listed in § 1926.1416 (‘‘listed operational aids’’).	Operational aids. Devices that assist the operator in the safe operation of the crane by providing information or automatically taking control of a crane function. These include, but are not limited to, the devices listed in §5016 (“listed operational aids”).	
Operational controls means levers, switches, pedals and other devices for controlling equipment operation.	Operational controls. Levers, switches, pedals and other devices for controlling equipment operation.	
Operator means a person who is operating the equipment.	Operator. A person who is operating the equipment.	
Overhead and gantry cranes includes overhead/bridge cranes, semigantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment,	Overhead and gantry cranes includes overhead/bridge cranes, semigantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment,	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
irrespective of whether it travels on tracks, wheels, or other means.	irrespective of whether it travels on tracks, wheels, or other means.	
Paragraph refers to a paragraph in the same section of this subpart that the word ''paragraph'' is used, unless otherwise specified.		CA standards use "section" rather than "paragraph."
Pendants includes both wire and bar types. Wire type: A fixed length of wire rope with mechanical fittings at both ends for pinning segments of wire rope together. Bar type: Instead of wire rope, a bar is used. Pendants are typically used in a latticed boom crane system to easily change the length of the boom suspension system without completely changing the rope on the drum when the boom length is increased or decreased.	Pendants includes both wire and bar types. (A) Wire type: A fixed length of wire rope with mechanical fittings at both ends for pinning segments of wire rope together. (B) Bar type: Instead of wire rope, a bar is used. Pendants are typically used in a latticed boom crane system to easily change the length of the boom suspension system without completely changing the rope on the drum when the boom length is increased or decreased.	
Personal fall arrest system means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body harness and may include a lanyard, deceleration device, lifeline, or suitable combination of these.	Personal fall arrest system. A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body harness and may include a lanyard, deceleration device, lifeline, or suitable combination of these.	
Portal crane is a type of crane consisting of a rotating upperstructure, hoist machinery, and boom mounted on top of a structural gantry which may be fixed in one location or have travel capability. The gantry legs or columns usually have portal openings in between to allow passage of traffic beneath the gantry.	Section 4885 (portions): (E) Gantry Crane. A crane similar to an overhead traveling crane, except that the bridge for carrying the trolley or trolleys is rigidly supported on two or more movable legs running on fixed rails or other runway. *** (O) Portal Crane (Whirley Type). A gantry crane without trolley motion, which has a boom attached to a revolving crane mounted on a gantry, with the boom capable of being raised	CA Section 4885, definition of "Portal Crane" also includes an illustration (Fig. 5), thus we are of the opinion that it is equally effective.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	or lowered at its head (outer end). Portal cranes may be fixed or mobile.	
Power lines means electric transmission and distribution lines.	Power lines means electric transmission and distribution lines.	
Procedures include, but are not limited to: Instructions, diagrams, recommendations, warnings, specifications, protocols and limitations.	Procedures include, but are not limited to: Instructions, diagrams, recommendations, warnings, specifications, protocols and limitations.	
Proximity alarm is a device that provides a warning of proximity to a power line and that has been listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.	Proximity alarm. A device that provides a warning of proximity to a power line and that has been listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7, or approved in accordance with Section 3206.	
Qualified evaluator (not a third party) means a person employed by the signal person's employer who has demonstrated that he/she is competent in accurately assessing whether individuals meet the Qualification Requirements in this subpart for a signal person.	Qualified evaluator (not a third party). A person employed by the signal person's employer who has demonstrated that he/she is competent in accurately assessing whether individuals meet the Qualification Requirements in this Group 13 for a signal person.	
Qualified evaluator (third party) means an entity that, due to its independence and expertise, has demonstrated that it is competent in accurately assessing whether individuals meet the Qualification Requirements in this subpart for a signal person.	Qualified evaluator (third party). An entity that, due to its independence and expertise, has demonstrated that it is competent in accurately assessing whether individuals meet the Qualification Requirements in this Group 13 for a signal person.	
Qualified person means a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject matter, the work, or the project.	Qualified Person, Attendant or Operator. A person designated by the employer who by reason of his training and experience has demonstrated his ability to safely perform his duties and, where required, is properly licensed in accordance with federal, state, or local laws and regulations.	California has a single definition for "qualified person" which applies horizontally. For cranes, California uses certified agents, certificating agencies, and, in some cases, RPE's for tasks which the federal standards delegate to qualified persons. Thus California standards are more protective.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Qualified rigger is a rigger who meets the criteria for a qualified person.	Qualified rigger is a rigger who meets the criteria for a qualified person.	
Range control limit device is a device that can be set by an equipment operator to limit movement of the boom or jib tip to a plane or multiple planes.	Range control limit device. A device that can be set by an equipment operator to limit movement of the boom or jib tip to a plane or multiple planes.	
Range control warning device is a device that can be set by an equipment operator to warn that the boom or jib tip is at a plane or multiple planes.	Range control warning device. A device that can be set by an equipment operator to warn that the boom or jib tip is at a plane or multiple planes.	
Rated capacity means the maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.	Rated capacity. The maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.	
Rated capacity indicator: See load moment indicator.	Rated capacity indicator: See load moment indicator.	
Rated capacity limiter: See load moment limiter.	Rated capacity limiter: See load moment limiter.	
Repetitive pickup points refer to, when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.	Repetitive pickup points refer to, when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.	
Running wire rope means a wire rope that moves over sheaves or drums.	Running wire rope. A wire rope that moves over sheaves or drums.	
Runway means a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.	Runway. A firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.	
Section means a section of this subpart, unless		Not applicable for CA formatting.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
otherwise specified.		
Sideboom crane means a track-type or wheel-type tractor having a boom mounted on the side of the tractor, used for lifting, lowering or transporting a load suspended on the load hook. The boom or hook can be lifted or lowered in a vertical direction only.	Sideboom crane. A track-type or wheel-type tractor having a boom mounted on the side of the tractor, used for lifting, lowering or transporting a load suspended on the load hook. The boom or hook can be lifted or lowered in a vertical direction only.	
Special hazard warnings means warnings of site-specific hazards (for example, proximity of power lines).	Special hazard warnings. Warnings of site-specific hazards (for example, proximity of power lines).	
Stability (flotation device) means the tendency of a barge, pontoons, vessel or other means of flotation to return to an upright position after having been inclined by an external force.	Stability (flotation device). The tendency of a barge, pontoons, vessel or other means of flotation to return to an upright position after having been inclined by an external force.	
Standard Method means the protocol in Appendix A of this subpart for hand signals.	Standard Method. The protocol illustrated in Section 5001, Plate I, for hand signals.	
Such as means ‘‘such as, but not limited to.’’	Such as means “such as, but not limited to.”	
Superstructure: See Upperworks.	Superstructure: See “Upperworks.”	
Tagline means a rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.	Tagline. A rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.	
Tender means an individual responsible for monitoring and communicating with a diver.		N/A for cranes.
Tilt up or tilt down operation means raising/lowering a load from the horizontal to vertical or vertical to horizontal.	Tilt up or tilt down operation. Raising/lowering a load from the horizontal to vertical or vertical to horizontal.	
Tower crane is a type of lifting structure which utilizes a vertical mast or tower to support a working boom (jib) in an elevated position. Loads are suspended from the working boom. While the working boom may be of the fixed type (horizontal or angled) or have luffing	(V) Tower Crane. A crane in which a boom, swinging jib or other structural member is mounted on a vertical mast or tower. (1) Tower Crane (Climber). A crane erected upon and supported by a building or other structure which may be raised or lowered to	CA Section 4885, definition of “Tower Crane” also includes an illustrations (Figs. 15-17), thus we believe it is equally effective.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
capability, it can always rotate to swing loads, either by rotating on the top of the tower (top slewing) or by the rotation of the tower (bottom slewing). The tower base may be fixed in one location or ballasted and moveable between locations. Mobile cranes that are configured with luffing jib and/or tower attachments are not considered tower cranes under this section.	different floors or levels of the building or structure. (2) Tower Crane (Free Standing). A crane with a horizontally swinging, usually non-luffing boom which may be on a fixed base or mounted on rails. (3) Tower Crane (Mobile). A tower crane which is mounted on a crawler, truck or similar carrier for travel or transit. (4) Tower Crane (Self-Erector). A mobile tower crane that is truck carrier mounted and capable of self-erection.	
Travel bogie (tower cranes) is an assembly of two or more axles arranged to permit vertical wheel displacement and equalize the loading on the wheels.	Trolley (Travel bogie). A truck or carriage supporting the load mounted on an overhead beam, bridge, cableway or track.	CA uses the term "trolley" however, we propose to modify the CA definition to also include "travel bogie."
Trim means angle of inclination about the transverse axis of a barge, pontoons, vessel or other means of floatation.	Trim. Angle of inclination about the transverse axis of a barge, pontoons, vessel or other means of floatation.	
Two blocking means a condition in which a component that is uppermost on the hoist line such as the load block, hook block, overhaul ball, or similar component, comes in contact with the boom tip, fixed upper block or similar component. This binds the system and continued application of power can cause failure of the hoist rope or other component.	Two-Blocking. A condition in which the lower load block or hook assembly comes into contact with the upper load block or boom point sheave assembly. This binds the system and continued application of power can cause failure of the hoist rope or other component.	CA definition amended for additional clarity and consistency with federal definition.
Unavailable procedures means procedures that are no longer available from the manufacturer, or have never been available, from the manufacturer.	Unavailable procedures. Procedures that are no longer available from the manufacturer, or have never been available, from the manufacturer.	
Upperstructure: See Upperworks.	Upperstructure: See "Upperworks."	
Upperworks means the revolving frame of equipment on which the operating machinery	Upperworks. The revolving frame of equipment on which the operating machinery (and many	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(and many cases the engine) are mounted along with the operator's cab. The counterweight is typically supported on the rear of the upperstructure and the boom or other front end attachment is mounted on the front.	cases the engine) are mounted along with the operator's cab. The counterweight is typically supported on the rear of the upperstructure and the boom or other front end attachment is mounted on the front.	
Up to means ''up to and including.''	Up to means ''up to and including.''	
Wire rope means a flexible rope constructed by laying steel wires into various patterns of multi-wired strands around a core system to produce a helically wound rope.	Wire rope. A flexible rope constructed by laying steel wires into various patterns of multi-wired strands around a core system to produce a helically wound rope.	
§ 1926.1402 Ground conditions.	**§4991.1 Ground Conditions.**	
(a) Definitions. (1) ''Ground conditions'' means the ability of the ground to support the equipment (including slope, compaction, and firmness).	(a) Definitions. (1) ''Ground conditions'' means the ability of the ground to support the equipment (including slope, compaction, and firmness).	
(2) ''Supporting materials'' means blocking, mats, cribbing, marsh buggies (in marshes/ wetlands), or similar supporting materials or devices.	(2) ''Supporting materials'' means blocking, mats, cribbing, marsh buggies (in marshes/ wetlands), or similar supporting materials or devices.	
(b) The equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met. The requirement for the ground to be drained does not apply to marshes/wetlands.	(b) The equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met. The requirement for the ground to be drained does not apply to marshes/wetlands.	
(c) The controlling entity must: (1) Ensure that ground preparations necessary to meet the requirements in paragraph (b) of this section are provided.	(c) The controlling entity shall: (1) Ensure that ground preparations necessary to meet the requirements in subsection (b) are provided.	
(2) Inform the user of the equipment and the	(2) Inform the user of the equipment and the	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
operator of the location of hazards beneath the equipment set-up area (such as voids, tanks, utilities) if those hazards are identified in documents (such as site drawings, as built drawings, and soil analyses) that are in the possession of the controlling entity (whether at the site or off-site) or the hazards are otherwise known to that controlling entity.	operator of the location of hazards beneath the equipment set-up area (such as voids, tanks, utilities) if those hazards are identified in documents (such as site drawings, as-built drawings, and soil analyses) that are in the possession of the controlling entity (whether at the site or off-site) or the hazards are otherwise known to that controlling entity.	
(d) If there is no controlling entity for the project, the requirement in paragraph (c)(1) of this section must be met by the employer that has authority at the site to make or arrange for ground preparations needed to meet paragraph (b) of this section.	(d) If there is no controlling entity for the project, the requirement in subsection (c)(1) shall be met by the employer that has authority at the site to make or arrange for ground preparations needed to meet subsection (b).	
(e) If the A/D director or the operator determines that ground conditions do not meet the requirements in paragraph (b) of this section, that person's employer must have a discussion with the controlling entity regarding the ground preparations that are needed so that, with the use of suitable supporting materials/ devices (if necessary), the requirements in paragraph (b) of this section can be met.	(e) If the A/D director or the operator determines that ground conditions do not meet the requirements in subsection (b), that person's employer shall have a discussion with the controlling entity regarding the ground preparations that are needed so that, with the use of suitable supporting materials/ devices (if necessary), the requirements in subsection (b) can be met.	
(f) This section does not apply to cranes designed for use on railroad tracks when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213 and that comply with applicable Federal Railroad Administration requirements.	(f) This section does not apply to cranes designed for use on railroad tracks when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213 and that comply with applicable Federal Railroad Administration requirements.	
§ 1926.1403 Assembly/Disassembly—selection of manufacturer or employer	**§4992. ~~Booms.~~ Assembly/Disassembly—Selection of Manufacturer or Employer**	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
procedures.	**Procedures.**	
When assembling or disassembling equipment (or attachments), the employer must comply with all applicable manufacturer prohibitions and must comply with either: (a) Manufacturer procedures applicable to assembly and disassembly, or (b) Employer procedures for assembly and disassembly. Employer procedures may be used only where the employer can demonstrate that the procedures used meet the requirements in § 1926.1406. Note: The employer must follow manufacturer procedures when an employer uses synthetic slings during assembly or disassembly rigging. (See § 1926.1404(r).)	When assembling or disassembling equipment (or attachments), the employer shall comply with all applicable manufacturer procedures and prohibitions applicable to assembly and disassembly. NOTE: The employer must follow manufacturer procedures when an employer uses synthetic slings during assembly or disassembly rigging. [See §4992.1(r)].	Use of employer procedures not permitted in California.
§ 1926.1404 Assembly/Disassembly—general requirements (applies to all assembly and disassembly operations).	§4992.1. Assembly/Disassembly—General Requirements (applies to all assembly and disassembly operations).	
(a) Supervision—competent-qualified person. (1) Assembly/disassembly must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (‘‘A/D director’’). (2) Where the assembly/disassembly is being performed by only one person, that person must meet the criteria for both a competent person and a qualified person. For purposes of this standard, that person is considered the A/D director.	(a) Supervision—competent-qualified person. (1) Assembly/disassembly shall be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (‘‘A/D director’’). (2) Where the assembly/disassembly is being performed by only one person, that person shall meet the criteria for both a competent person and a qualified person. For purposes of this standard, that person is considered the A/D director.	
(b) Knowledge of procedures. The A/D director must understand the applicable assembly/ disassembly procedures.	(b) Knowledge of procedures. The A/D director shall understand the applicable assembly/ disassembly procedures.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(c) Review of procedures. The A/D director must review the applicable assembly/ disassembly procedures immediately prior to the commencement of assembly/disassembly unless the A/D director understands the procedures and has applied them to the same type and configuration of equipment (including accessories, if any).	(c) Review of procedures. The A/D director shall review the applicable assembly/ disassembly procedures immediately prior to the commencement of assembly/disassembly unless the A/D director understands the procedures and has applied them to the same type and configuration of equipment (including accessories, if any).	
(d) Crew instructions. (1) Before commencing assembly/disassembly operations, the A/D director must ensure that the crew members understand all of the following: (i) Their tasks. (ii) The hazards associated with their tasks. (iii) The hazardous positions/locations that they need to avoid. (2) During assembly/disassembly operations, before a crew member takes on a different task, or when adding new personnel during the operations, the requirements in paragraphs (d)(1)(i) through (d)(1)(iii) of this section must be met.	(d) Crew instructions. (1) Before commencing assembly/disassembly operations, the A/D director shall ensure that the crew members understand all of the following: (A) Their tasks. (B) The hazards associated with their tasks. (C) The hazardous positions/locations that they need to avoid. (2) During assembly/disassembly operations, before a crew member takes on a different task, or when adding new personnel during the operations, the requirements in subsections (d)(1)(A) through (d)(1)(C) of this section shall be met.	
(e) Protecting assembly/disassembly crew members out of operator view. (1) Before a crew member goes to a location that is out of view of the operator and is either in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member must inform the operator that he/she is going to that location. (2) Where the operator knows that a crew member went to a location covered by	(e) Protecting assembly/disassembly crew members out of operator view. (1) Before a crew member goes to a location that is out of view of the operator and is either in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member must inform the operator that he/she is going to that location. (2) Where the operator knows that a crew member went to a location covered by	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
paragraph (e)(1) of this section, the operator must not move any part of the equipment (or load) until the operator is informed in accordance with a prearranged system of communication that the crew member is in a safe position.	subsection (e)(1), the operator must not move any part of the equipment (or load) until the operator is informed in accordance with a prearranged system of communication that the crew member is in a safe position.	
(f) Working under the boom, jib or other components. (1) When pins (or similar devices) are being removed, employees must not be under the boom, jib, or other components, except where the requirements of paragraph (f)(2) of this section are met. (2) Exception. Where the employer demonstrates that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed, the A/D director must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom. (See Non-mandatory Appendix B of this subpart for an example.)	(f) Working under the boom, jib or other components. (1) When pins (or similar devices) are being removed, employees shall not be under the boom, jib, or other components.	California does not permit the exception.
(g) Capacity limits. During all phases of assembly/disassembly, rated capacity limits for loads imposed on the equipment, equipment components (including rigging), lifting lugs and equipment accessories, must not be exceeded for the equipment being assembled/ disassembled.	(g) Capacity limits. During all phases of assembly/disassembly, rated capacity limits for loads imposed on the equipment, equipment components (including rigging), lifting lugs and equipment accessories, shall not be exceeded for the equipment being assembled/disassembled.	
(h) Addressing specific hazards. The A/D director supervising the assembly/disassembly operation must address the hazards associated with the operation, which include:	(h) Addressing specific hazards. The A/D director supervising the assembly/disassembly operation shall address the hazards associated with the operation, which include but are not	New subsection (h)(1) will replace text of §4992. Booms, which reads: "Booms which are being assembled or disassembled on the ground shall be securely

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(1) Site and ground bearing conditions. Site and ground conditions must be adequate for safe assembly/disassembly operations and to support the equipment during assembly/disassembly (see § 1926.1402 for ground condition requirements). (2) Blocking material. The size, amount, condition and method of stacking the blocking must be sufficient to sustain the loads and maintain stability. (3) Proper location of blocking. When used to support lattice booms or components, blocking must be appropriately placed to: (i) Protect the structural integrity of the equipment, and (ii) Prevent dangerous movement and collapse. (4) Verifying assist crane loads. When using an assist crane, the loads that will be imposed on the assist crane at each phase of assembly/disassembly must be verified in accordance with § 1926.1417(o)(3) before assembly/disassembly begins. (5) Boom and jib pick points. The point(s) of attachment of rigging to a boom (or boom sections or jib or jib sections) must be suitable for preventing structural damage and facilitating safe handling of these components. (6) Center of gravity. (i) The center of gravity of the load must be identified if that is necessary for the method used for maintaining stability. (ii) Where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended	limited to: (1) Site and ground bearing conditions. Site and ground conditions shall be adequate for safe assembly/disassembly operations and to support the equipment during assembly/disassembly (see §4991.1 for ground condition requirements). (2) Blocking material. The size, amount, condition and method of stacking the blocking shall be sufficient to sustain the loads and maintain stability. (3) Proper location of blocking. When used to support lattice booms or components, blocking shall be appropriately placed to: (A) Protect the structural integrity of the equipment, and (B) Prevent dangerous movement and collapse. (4) Verifying assist crane loads. When using an assist crane, the loads that will be imposed on the assist crane at each phase of assembly/disassembly shall be verified in accordance with §4999(b) before assembly/disassembly begins. (5) Boom and jib pick points. The point(s) of attachment of rigging to a boom (or boom sections or jib or jib sections) shall be suitable for preventing structural damage and facilitating safe handling of these components. (6) Center of gravity. (A) The center of gravity of the load shall be identified if that is necessary for the method used for maintaining stability. (B) Where there is insufficient information to accurately identify the center of gravity,	blocked or secured to prevent dropping of the boom and boom sections." Federal verbiage for (h) clarified to indicate that the hazards are not limited to those listed

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
dangerous movement resulting from an inaccurate identification of the center of gravity must be used. (See Non-mandatory Appendix B of this subpart for an example.) (7) Stability upon pin removal. The boom sections, boom suspension systems (such as gantry A-frames and jib struts), and components must be rigged or supported to maintain stability upon the removal of the pins. (8) Snagging. Suspension ropes and pendants must not be allowed to catch on the boom or jib connection pins or cotter pins (including keepers and locking pins).	measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity shall be used. (7) Stability upon pin removal. The boom sections, boom suspension systems (such as gantry A-frames and jib struts), and components shall be rigged or supported to maintain stability upon the removal of the pins. (8) Snagging. Suspension ropes and pendants shall not be allowed to catch on the boom or jib connection pins or cotter pins (including keepers and locking pins).	
(9) Struck by counterweights. The potential for unintended movement from inadequately supported counterweights and from hoisting counterweights.	(9) Struck by counterweights. The potential for unintended movement from inadequately supported counterweights and from hoisting counterweights.	
(10) Boom hoist brake failure. Each time reliance is to be placed on the boom hoist brake to prevent boom movement during assembly/disassembly, the brake must be tested prior to such reliance to determine if it is sufficient to prevent boom movement. If it is not sufficient, a boom hoist pawl, other locking device/back-up braking device, or another method of preventing dangerous movement of the boom (such as blocking or using an assist crane) from a boom hoist brake failure must be used.	(10) Boom hoist brake failure. Each time reliance is to be placed on the boom hoist brake to prevent boom movement during assembly/disassembly, the brake shall be tested prior to such reliance to determine if it is sufficient to prevent boom movement. If it is not sufficient, a boom hoist pawl, other locking device/back-up braking device, or another method of preventing dangerous movement of the boom (such as blocking or using an assist crane) from a boom hoist brake failure shall be used.	
(11) Loss of backward stability. Backward stability before swinging the upperworks, travel, and when attaching or removing equipment components.	(11) Loss of backward stability. Backward stability before swinging the upperworks, travel, and when attaching or removing equipment components.	
(12) Wind speed and weather. The effect of	(12) Wind speed and weather. The effect of	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
wind speed and weather on the equipment.	wind speed and weather on the equipment.	
(i) [Reserved.] (j) Cantilevered boom sections. Manufacturer limitations on the maximum amount of boom supported only by cantilevering must not be exceeded. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must determine in writing this limitation, which must not be exceeded.	(i) [Reserved.] (j) Cantilevered boom sections. Manufacturer limitations on the maximum amount of boom supported only by cantilevering shall not be exceeded. Where these are unavailable, a California registered professional engineer familiar with the type of equipment involved must determine in writing this limitation, which shall not be exceeded.	
(k) Weight of components. The weight of each of the components must be readily available. (l) [Reserved.]	(k) Weight of components. The weight of each of the components must be readily available. (*l*) [Reserved.]	
(m) Components and configuration. (1) The selection of components, and configuration of the equipment, that affect the capacity or safe operation of the equipment must be in accordance with: (i) Manufacturer instructions, prohibitions, limitations, and specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or (ii) Approved modifications that meet the requirements of § 1926.1434 (Equipment modifications). (2) Post-assembly inspection. Upon completion of assembly, the equipment must be inspected to ensure compliance with paragraph (m)(1) of this section (see § 1926.1412(c) for post-assembly inspection requirements). (n) [Reserved.]	(m) Components and configuration. (1) The selection of components, and configuration of the equipment, that affect the capacity or safe operation of the equipment shall be in accordance with: (A) Manufacturer instructions, prohibitions, limitations, and specifications. Where these are unavailable, a California registered professional engineer familiar with the type of equipment involved shall approve, in writing, the selection and configuration of components; or (B) Approved modifications that meet the requirements of §5027 (Equipment Modifications). (2) Post-assembly inspection. Upon completion of assembly, the equipment shall be inspected to ensure compliance with subsection (m)(1) (see §5031.6 for post-assembly inspection requirements). (n) [Reserved.]	
(o) Shipping pins. Reusable shipping pins,	(o) Shipping pins. Reusable shipping pins,	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
straps, links, and similar equipment must be removed. Once they are removed they must either be stowed or otherwise stored so that they do not present a falling object hazard.	straps, links, and similar equipment shall be removed. Once they are removed they shall either be stowed or otherwise stored so that they do not present a falling object hazard.	
(p) Pile driving. Equipment used for pile driving must not have a jib attached during pile driving operations.	(p) Pile driving. Equipment used for pile driving shall not have a jib attached during pile driving operations.	
(q) Outriggers and Stabilizers. When the load to be handled and the operating radius require the use of outriggers or stabilizers, or at any time when outriggers or stabilizers are used, all of the following requirements must be met (except as otherwise indicated): (1) The outriggers or stabilizers must be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart. (2) The outriggers must be set to remove the equipment weight from the wheels, except for locomotive cranes (see paragraph (q)(6) of this section for use of outriggers on locomotive cranes). This provision does not apply to stabilizers.	(q) Outriggers and Stabilizers. When the load to be handled and the operating radius require the use of outriggers or stabilizers, or at any time when outriggers or stabilizers are used, all of the following requirements shall be met (except as otherwise indicated): (1) The outriggers or stabilizers shall be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart. (2) The outriggers shall be set to remove the equipment weight from the wheels, except for locomotive cranes (see subsection (q)(6) for use of outriggers on locomotive cranes). This provision does not apply to stabilizers.	
(3) When outrigger floats are used, they must be attached to the outriggers. When stabilizer floats are used, they must be attached to the stabilizers. (4) Each outrigger or stabilizer must be visible to the operator or to a signal person during extension and setting. (5) Outrigger and stabilizer blocking must: (i) Meet the requirements in paragraphs (h)(2) and (h)(3) of this section. (ii) Be placed only under the outrigger or stabilizer float/pad of the jack or, where the	(3) When outrigger floats are used, they shall be attached to the outriggers. When stabilizer floats are used, they shall be attached to the stabilizers. (4) Each outrigger or stabilizer shall be visible to the operator or to a signal person during extension and setting. (5) Outrigger and stabilizer blocking shall: (A) Meet the requirements in subsections (h)(2) and (h)(3). (B) Be placed only under the outrigger or stabilizer float/pad of the jack or, where the	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
outrigger or stabilizer is designed without a jack, under the outer bearing surface of the extended outrigger or stabilizer beam. (6) For locomotive cranes, when using outriggers or stabilizers to handle loads, the manufacturer's procedures must be followed. When lifting loads without using outriggers or stabilizers, the manufacturer's procedures must be met regarding truck wedges or screws.	outrigger or stabilizer is designed without a jack, under the outer bearing surface of the extended outrigger or stabilizer beam. (6) For locomotive cranes, when using outriggers or stabilizers to handle loads, the manufacturer's procedures shall be followed. When lifting loads without using outriggers or stabilizers, the manufacturer's procedures shall be met regarding truck wedges or screws.	
(r) Rigging. In addition to following the requirements in 29 CFR 1926.251 and other requirements in this and other standards applicable to rigging, when rigging is used for assembly/disassembly, the employer must ensure that: (1) The rigging work is done by a qualified rigger. (2) Synthetic slings are protected from: Abrasive, sharp or acute edges, and configurations that could cause a reduction of the sling's rated capacity, such as distortion or localized compression. Note: Requirements for the protection of wire rope slings are contained in 29 CFR 1926.251(c)(9). (3) When synthetic slings are used, the synthetic sling manufacturer's instructions, limitations, specifications and recommendations must be followed.	(r) Rigging. In addition to following the requirements in General Industry Safety Orders, Article 101 and other requirements in this and other standards applicable to rigging, when rigging is used for assembly/disassembly, the employer shall ensure that: (1) The rigging work is done by a qualified rigger. (2) Synthetic slings are protected from: Abrasive, sharp or acute edges, and configurations that could cause a reduction of the sling's rated capacity, such as distortion or localized compression. Note: Requirements for the protection of wire rope slings are contained in General Industry Safety Orders, Article 101, Section 5042. (3) When synthetic slings are used, the synthetic sling manufacturer's instructions, limitations, specifications and recommendations shall be followed.	
§ 1926.1405 Disassembly—additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures).	§4992.2. Disassembly—Additional Requirements for Dismantling of Booms and Jibs (applies to both the use of manufacturer procedures and employer procedures).	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Dismantling (including dismantling for changing the length of) booms and jibs.	Dismantling (including dismantling for changing the length of) booms and jibs.	
(a) None of the pins in the pendants are to be removed (partly or completely) when the pendants are in tension. (b) None of the pins (top or bottom) on boom sections located between the pendant attachment points and the crane/derrick body are to be removed (partly or completely) when the pendants are in tension. (c) None of the pins (top or bottom) on boom sections located between the uppermost boom section and the crane/derrick body are to be removed (partly or completely) when the boom is being supported by the uppermost boom section resting on the ground (or other support). (d) None of the top pins on boom sections located on the cantilevered portion of the boom being removed (the portion being removed ahead of the pendant attachment points) are to be removed (partly or completely) until the cantilevered section to be removed is fully supported.	(a) None of the pins in the pendants are to be removed (partly or completely) when the pendants are in tension. (b) None of the pins (top or bottom) on boom sections located between the pendant attachment points and the crane/derrick body are to be removed (partly or completely) when the pendants are in tension. (c) None of the pins (top or bottom) on boom sections located between the uppermost boom section and the crane/derrick body are to be removed (partly or completely) when the boom is being supported by the uppermost boom section resting on the ground (or other support). (d) None of the top pins on boom sections located on the cantilevered portion of the boom being removed (the portion being removed ahead of the pendant attachment points) are to be removed (partly or completely) until the cantilevered section to be removed is fully supported.	
§ 1926.1406 Assembly/Disassembly—employer procedures—general requirements.		California standards do not permit employer-developed procedures (employer standards may not be as protective).
(a) When using employer procedures instead of manufacturer procedures for assembly/ disassembly, the employer must ensure that the procedures: (1) Prevent unintended dangerous movement, and prevent collapse, of any part of the equipment.		

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(2) Provide adequate support and stability of all parts of the equipment. (3) Position employees involved in the assembly/disassembly operation so that their exposure to unintended movement or collapse of part or all of the equipment is minimized. (b) Qualified person. Employer procedures must be developed by a qualified person.		
§ 1926.1407 Power line safety (up to 350 kV)—assembly and disassembly.	**§4992.3. Power Line Safety (up to 350 kV)—Assembly and Disassembly.**	
(a) Before assembling or disassembling equipment, the employer must determine if any part of the equipment, load line, or load (including rigging and lifting accessories) could get, in the direction or area of assembly/disassembly, closer than 20 feet to a power line during the assembly/disassembly process. If so, the employer must meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows: (1) Option (1)—Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (2) Option (2)—20 foot clearance. Ensure that no part of the equipment, load line or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in paragraph (b) of this section. (3) Option (3)—Table A clearance. (i) Determine the line's voltage and the minimum clearance distance permitted under	(a) Before assembling or disassembling equipment, the employer shall determine if any part of the equipment, load line, or load (including rigging and lifting accessories) could get closer than 20 feet to a power line during the assembly/disassembly process. If so, the employer shall meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows: (1) Option (1)—Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (2) Option (2)—20 foot clearance. Ensure that no part of the equipment, load line or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in subsection (b). (3) Option (3)—Table A clearance. (A) Determine the line's voltage and the minimum clearance distance permitted under Table A (see §5003.1).	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Table A (see § 1926.1408). (ii) Determine if any part of the equipment, load line, or load (including rigging and lifting accessories), could get closer than the minimum clearance distance to the power line permitted under Table A (see § 1926.1408). If so, then the employer must follow the requirements in paragraph (b) of this section to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum clearance distance.	(B) Determine if any part of the equipment, load line, or load (including rigging and lifting accessories), could get closer than the minimum clearance distance to the power line permitted under Table A (see §5003.1). If so, then the employer shall follow the requirements in subsection (b) to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum clearance distance.	
(b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2), or Option (3) of this section, all of the following requirements must be met: (1) Conduct a planning meeting with the Assembly/Disassembly director (A/D director), operator, assembly/disassembly crew and the other workers who will be in the assembly/disassembly area to review the location of the power line(s) and the steps that will be implemented to prevent encroachment/ electrocution. (2) If tag lines are used, they must be nonconductive. (3) At least one of the following additional measures must be in place. The measure selected from this list must be effective in preventing encroachment. The additional measures are: (i) Use a dedicated spotter who is in continuous contact with the equipment operator. The dedicated spotter must:	(b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2), or Option (3) of this section, all of the following requirements shall be met: (1) Conduct a planning meeting with the A/D Director, operator, assembly/disassembly crew and the other workers who will be in the assembly/disassembly area to review the location of the power line(s) and the steps that will be implemented to prevent encroachment/ electrocution. (2) If tag lines are used, they shall be nonconductive. (3) At least one of the following additional measures shall be in place. The measure selected from this list must be effective in preventing encroachment. The additional measures are: (A) Use a dedicated spotter who is in continuous contact with the equipment operator. The dedicated spotter shall: 1. Be equipped with a visual aid to assist in	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(A) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible lineof-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (B) Be positioned to effectively gauge the clearance distance. (C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (D) Give timely information to the operator so that the required clearance distance can be maintained.	identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). 2. Be positioned to effectively gauge the clearance distance. 3. Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. 4. Give timely information to the operator so that the required clearance distance can be maintained.	
(ii) A proximity alarm set to give the operator sufficient warning to prevent encroachment.		Proximity alarms are not accepted in California as a reliable means of preventing encroachment/electrocution.
(iii) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device must be set to give the operator sufficient warning to prevent encroachment. (iv) A device that automatically limits range of movement, set to prevent encroachment.		Automatic protective devices are not as protective as California requirements.
(v) An elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.	(B) An elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.	
(c) Assembly/disassembly below power lines prohibited. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially or fully	(c) Assembly/disassembly below power lines prohibited. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially or fully	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
assembled, is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line. (d) Assembly/disassembly inside Table A clearance prohibited. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially or fully assembled, is allowed closer than the minimum approach distance under Table A (see § 1926.1408) to a power line unless the employer has confirmed that the utility owner/ operator has deenergized and (at the worksite) visibly grounded the power line. (e) Voltage information. Where Option (3) of this section is used, the utility owner/operator of the power lines must provide the requested voltage information within two working days of the employer's request. (f) Power lines presumed energized. The employer must assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (g) Posting of electrocution warnings. There must be at least one electrocution hazard warning conspicuously posted in the cab so that it is in view of the operator and (except for overhead gantry and tower cranes) at least two on the outside of the equipment.	assembled, is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line. (d) Assembly/disassembly inside Table A clearance prohibited. No part of a crane/ derrick, load line, or load (including rigging and lifting accessories), whether partially or fully assembled, is allowed closer than the minimum approach distance under Table A (see §5003.1) to a power line unless the employer has confirmed that the utility owner/ operator has deenergized and (at the worksite) visibly grounded the power line. (e) Voltage information. Where Option (3) of this section is used, the utility owner/operator of the power lines shall provide the requested voltage information within two working days of the employer's request. (f) Power lines presumed energized. The employer shall assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (g) Posting of electrocution warnings. There shall be at least one electrocution hazard warning conspicuously posted in the cab so that it is in view of the operator and (except for overhead gantry and tower cranes) at least two on the outside of the equipment.	
§ 1926.1408 Power line safety (up to 350 kV)—equipment operations.	5003.1. Power Line Safety (up to 350 kV) – Equipment Operations.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(a) Hazard assessments and precautions inside the work zone. Before beginning equipment operations, the employer must: (1) Identify the work zone by either: (i) Demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibiting the operator from operating the equipment past those boundaries, or (ii) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working radius.	(a) Hazard assessments and precautions inside the work zone. Before beginning equipment operations, the employer shall: (1) Identify the work zone by either: (A) Demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibiting the operator from operating the equipment past those boundaries, or (B) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working radius.	
(2) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get closer than 20 feet to a power line. If so, the employer must meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows: (i) Option (1)—Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (ii) Option (2)—20 foot clearance. Ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in paragraph (b) of this section. (iii) Option (3)—Table A clearance. (A) Determine the line's voltage and the minimum approach distance permitted under	(2) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get closer than 20 feet to a power line. If so, the employer shall meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows: (A) Option (1)—Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (B) Option (2)—20 foot clearance. Ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in subsection (b). (C) Option (3)—Table A clearance. 1. Determine the line's voltage and the minimum approach distance permitted under	

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FEDERAL: §1926	STATE:	RATIONALE
Table A (see § 1926.1408). (B) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), while operating up to the equipment's maximum working radius in the work zone, could get closer than the minimum approach distance of the power line permitted under Table A (see § 1926.1408). If so, then the employer must follow the requirements in paragraph (b) of this section to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.	Table A. 2. Determine if any part of the equipment, load line or load (including rigging and lifting accessories), while operating up to the equipment's maximum working radius in the work zone, could get closer than the minimum approach distance of the power line permitted under Table A. If so, then the employer shall follow the requirements in subsection (b) to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.	
(b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2) or Option (3) of this section, all of the following requirements must be met: (1) Conduct a planning meeting with the operator and the other workers who will be in the area of the equipment or load to review the location of the power line(s), and the steps that will be implemented to prevent encroachment/electrocution. (2) If tag lines are used, they must be non-conductive. (3) Erect and maintain an elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings, at 20 feet from the power line (if using Option (2) of this section) or at the minimum approach distance under Table A (see § 1926.1408) (if using Option (3) of this section). If the operator is unable to see the	(b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2) or Option (3) of this section, all of the following requirements shall be met: (1) Conduct a planning meeting with the operator and the other workers who will be in the area of the equipment or load to review the location of the power line(s), and the steps that will be implemented to prevent encroachment/electrocution. (2) If tag lines are used, they shall be non-conductive. (3) Erect and maintain an elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings, at 20 feet from the power line (if using Option (2) of this section) or at the minimum approach distance under Table A (if using Option (3) of this section). If the operator is unable to see the elevated warning	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
elevated warning line, a dedicated spotter must be used as described in § 1926.1408(b)(4)(ii) in addition to implementing one of the measures described in §§ 1926.1408(b)(4)(i), (iii), (iv) and (v). (4) Implement at least one of the following measures:	line, a dedicated spotter shall be used as described in subsection (b)(4)(B) in addition to implementing one of the measures described in subsections (b)(4)(A), (C), (D) and (E). (4) Implement at least one of the following measures:	
(i) A proximity alarm set to give the operator sufficient warning to prevent encroachment.		Proximity alarms are not accepted in California as a reliable means of preventing encroachment/electrocution.
(i) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter must: (A) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (B) Be positioned to effectively gauge the clearance distance. (C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (D) Give timely information to the operator so that the required clearance distance can be maintained. (iii) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device must be set to give the operator sufficient	(A) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter shall: 1. Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). 2. Be positioned to effectively gauge the clearance distance. 3. Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. 4. Give timely information to the operator so that the required clearance distance can be maintained. (B) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device shall be set to give the operator sufficient	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
warning to prevent encroachment. (iv) A device that automatically limits range of movement, set to prevent encroachment.	warning to prevent encroachment. (C) A device that automatically limits range of movement, set to prevent encroachment.	
(v) An insulating link/device, as defined in § 1926.1401, installed at a point between the end of the load line (or below) and the load.		Insulating links are not accepted in California as a reliable means of preventing electrocution.
(5) The requirements of paragraph (b)(4) of this section do not apply to work covered by subpart V of this part.	(5) The requirements of subsection (b)(4) do not apply to work covered by the High-Voltage Electrical Safety Orders.	
(c) Voltage information. Where Option (3) of this section is used, the utility owner/operator of the power lines must provide the requested voltage information within two working days of the employer's request.	(c) Voltage information. Where Option (3) of this section is used, the utility owner/operator of the power lines shall provide the requested voltage information within two working days of the employer's request.	
(d) Operations below power lines. (1) No part of the equipment, load line, or load (including rigging and lifting accessories) is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line, except where one of the exceptions in paragraph (d)(2) of this section applies. (2) Exceptions. Paragraph (d)(1) of this section is inapplicable where the employer demonstrates that one of the following applies: (i) The work is covered by subpart V of this part. (ii) For equipment with nonextensible booms: The uppermost part of the equipment, with the boom at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power	(d) Operations below power lines. (1) No part of the equipment, load line, or load (including rigging and lifting accessories) is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line, except where one of the exceptions in subsection (d)(2) applies. (2) EXCEPTIONS. Subsection (d)(1) is inapplicable where the employer demonstrates that one of the following applies: (A) The work is covered by the High-Voltage Electrical Safety Orders. (B) For equipment with nonextensible booms: The uppermost part of the equipment, with the boom at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
line. (iii) For equipment with articulating or extensible booms: The uppermost part of the equipment, with the boom in the fully extended position, at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power line. (iv) The employer demonstrates that compliance with paragraph (d)(1) of this section is infeasible and meets the requirements of § 1926.1410.	line. (C) For equipment with articulating or extensible booms: The uppermost part of the equipment, with the boom in the fully extended position, at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power line. (D) The employer demonstrates that compliance with subsection (d)(1) is infeasible and meets the requirements of §5003.3.	
(e) Power lines presumed energized. The employer must assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (f) When working near transmitter/communication towers where the equipment is close enough for an electrical charge to be induced in the equipment or materials being handled, the transmitter must be deenergized or the following precautions must be taken: (1) The equipment must be provided with an electrical ground. (2) If tag lines are used, they must be non-conductive.	(e) Power lines presumed energized. The employer shall assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (f) When working near transmitter/communication towers where the equipment is close enough for an electrical charge to be induced in the equipment or materials being handled, the transmitter shall be deenergized or the following precautions shall be taken: (1) The equipment shall be provided with an electrical ground. (2) If tag lines are used, they shall be non-conductive.	
(g) Training. (1) The employer must train each operator and crew member assigned to work with the equipment on all of the following:	(g) Training. (1) The employer shall train each operator and crew member assigned to work with the equipment on all of the following:	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(i) The procedures to be followed in the event of electrical contact with a power line. Such training must include: (A) Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground. (B) The importance to the operator's safety of remaining inside the cab except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab. (C) The safest means of evacuating from equipment that may be energized. (D) The danger of the potentially energized zone around the equipment (step potential). (E) The need for crew in the area to avoid approaching or touching the equipment and the load. (F) Safe clearance distance from power lines. (ii) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (iii) Power lines are presumed to be uninsulated unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power transmission and distribution confirms that a line is insulated.	(A) The procedures to be followed in the event of electrical contact with a power line. Such training shall include: 1. Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground. 2. The importance to the operator's safety of remaining inside the cab except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab. 3. The safest means of evacuating from equipment that may be energized. 4. The danger of the potentially energized zone around the equipment (step potential). 5. The need for crew in the area to avoid approaching or touching the equipment and the load. 6. Safe clearance distance from power lines. (B) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (C) Power lines are presumed to be uninsulated unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power transmission and distribution confirms that a line is insulated.	
(iv) The limitations of an insulating link/device, proximity alarm, and range control (and similar) device, if used.	(D) The limitations of a range control device, if used.	California does not consider proximity alarms and insulating links to be a reliable means of preventing encroachment/electrocution.
(v) The procedures to be followed to properly ground equipment and the limitations of grounding.	(E) The procedures to be followed to properly ground equipment and the limitations of grounding.	

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<table>
<tr><th>FEDERAL: §1926</th><th>STATE:</th><th>RATIONALE</th></tr>
<tr><td>(2) Employees working as dedicated spotters must be trained to enable them to effectively perform their task, including training on the applicable requirements of this section.
(3) Training under this section must be administered in accordance with § 1926.1430(g).
(h) Devices originally designed by the manufacturer for use as: A safety device (see § 1926.1415), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, must meet the manufacturer’s procedures for use and conditions of use.</td><td>(2) Employees working as dedicated spotters shall be trained to enable them to effectively perform their task, including training on the applicable requirements of this section.
(3) Training under this section shall be administered in accordance with §4884.3.
(h) Devices originally designed by the manufacturer for use as: A safety device (see §5015), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, shall meet the manufacturer’s procedures for use and conditions of use.</td><td></td></tr>
<tr><td>TABLE A—MINIMUM CLEARANCE DISTANCES
Voltage
(nominal, kV, alternating current)
Minimum clearance distance (feet)
up to 50
..... 10
over 50 to 200
..... 15
over 200 to 350
..... 20
over 350 to 500
..... 25
over 500 to 750
..... 35
over 750 to 1,000
..... 45
over 1,000
.....
(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).
Note: The value that follows ‘‘to’’ is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.</td><td>TABLE A—MINIMUM CLEARANCE DISTANCES
<table><tr><th>Voltage (nominal, kV, alternating current)</th><th>Minimum clearance distance (feet)</th></tr><tr><td>up to 50</td><td>10</td></tr><tr><td>over 50 to 175</td><td>15</td></tr><tr><td>over 175 to 350</td><td>20</td></tr><tr><td>over 350 to 550</td><td>27</td></tr><tr><td>over 550 to 1,000</td><td>45</td></tr><tr><td>over 1,000</td><td>(as established by the utility owner/ operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).</td></tr></table>
Note: The value that follows “to” is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.</td><td>CA Section 5003.1, Table A, has been coordinated with CA High-Voltage Electrical Safety Orders, Section 2946, Table 2. CA Table A Voltages and Clearances are based on Federal Table A or CA Section 2946, Table 2, whichever is more protective.</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>§ 1926.1409 Power line safety (over 350 kV).</td><td>§5003.2. Power Line Safety (Over 350 kV).</td><td></td></tr>
<tr><td>The requirements of § 1926.1407 and § 1926.1408 apply to power lines over 350 kV</td><td>The requirements of §4992.3 and §5003.1 apply to power lines over 350 kV except:</td><td></td></tr>
</table>

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FEDERAL: §1926	STATE:	RATIONALE
except: (a) For power lines at or below 1000 kV, wherever the distance ‘‘20 feet’’ is specified, the distance ‘‘50 feet’’ must be substituted; and (b) For power lines over 1000 kV, the minimum clearance distance must be established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution.	(a) For power lines at or below 1000 kV, wherever the distance ‘‘20 feet’’ is specified, the distance ‘‘50 feet’’ shall be substituted; and (b) For power lines over 1000 kV, the minimum clearance distance shall be established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution.	
§ 1926.1410 Power line safety (all voltages)—equipment operations closer than the Table A zone.	§5003.3. Power Line Safety (All Voltages) – Equipment Operations Closer than the Table A Zone.	
Equipment operations in which any part of the equipment, load line, or load (including rigging and lifting accessories) is closer than the minimum approach distance under Table A of § 1926.1408 to an energized power line is prohibited, except where the employer demonstrates that all of the following requirements are met: (a) The employer determines that it is infeasible to do the work without breaching the minimum approach distance under Table A of § 1926.1408.	Equipment operations in which any part of the equipment, load line, or load (including rigging and lifting accessories) is closer than the minimum approach distance under Table A of §5003.1 to an energized power line is prohibited.	With the exception of the text shown, CA does not propose to adopt the balance of this section. CA standards are more protective. See HVESO Section 2946, particularly 2946(b)(3). *[Editorial note: See also 2940.2, 2940.7, 2944(d)(2)]*
(b) The employer determines that, after consultation with the utility owner/operator, it is infeasible to deenergize and ground the power line or relocate the power line.		
(c) Minimum clearance distance. (1) The power line owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission		

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FEDERAL: §1926	STATE:	RATIONALE
and distribution determines the minimum clearance distance that must be maintained to prevent electrical contact in light of the on-site conditions. The factors that must be considered in making this determination include, but are not limited to: Conditions affecting atmospheric conductivity; time necessary to bring the equipment, load line, and load (including rigging and lifting accessories) to a complete stop; wind conditions; degree of sway in the power line; lighting conditions, and other conditions affecting the ability to prevent electrical contact.		
(2) Paragraph (c)(1) of this section does not apply to work covered by subpart V of this part; instead, for such work, the minimum clearance distances specified in § 1926.950 Table V–1 apply.		
Employers engaged in subpart V work are permitted to work closer than the distances in § 1926.950 Table V–1 where both the requirements of this section and § 1926.952(c)(3)(i) or (ii) are met.		
(d) A planning meeting with the employer and utility owner/operator (or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution) is held to determine the procedures that will be followed to prevent electrical contact and electrocution. At a minimum these procedures must include: (1) If the power line is equipped with a device that automatically reenergizes the circuit in the event of a power line automatic reclosing		

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FEDERAL: §1926	STATE:	RATIONALE
feature of the circuit interrupting device must be made inoperative if the design of the device permits.		
(2) A dedicated spotter who is in continuous contact with the operator. The dedicated spotter must: (i) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (ii) Be positioned to effectively gauge the clearance distance. (iii) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (iv) Give timely information to the operator so that the required clearance distance can be maintained.		
(3) An elevated warning line, or barricade (not attached to the crane), in view of the operator (either directly or through video equipment), equipped with flags or similar high-visibility markings, to prevent electrical contact. However, this provision does not apply to work covered by subpart V of this part.		
(4) Insulating link/device. (i) An insulating link/device installed at a point between the end of the load line (or below) and the load.		
(ii) For work covered by subpart V of this part,		

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the requirement in paragraph (d)(4)(i) of this section applies only when working inside the § 1926.950 Table V–1 clearance distances.		
(iii) For work covered by subpart V of this part involving operations where use of an insulating link/device is infeasible, the requirements of § 1910.269(p)(4)(iii)(B) or (C) may be substituted for the requirement in (d)(4)(i) of this section.		
(iv) Until November 8, 2011, the following procedure may be substituted for the requirement in paragraph (d)(4)(i) of this section: All employees, excluding equipment operators located on the equipment, who may come in contact with the equipment, the load line, or the load must be insulated or guarded from the equipment, the load line, and the load. Insulating gloves rated for the voltage involved are adequate insulation for the purposes of this paragraph.		
(v) Until November 8, 2013, the following procedure may be substituted for the requirement in (d)(4)(i) of this section: (A) The employer must use a link/device manufactured on or before November 8, 2011, that meets the definition of an insulating link/device, except that it has not been approved by a Nationally Recognized Testing Laboratory, and that is maintained and used in accordance with manufacturer requirements and recommendations, and is installed at a point between the end of the load line (or below) and the load; and (B) All employees, excluding equipment		

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FEDERAL: §1926	STATE:	RATIONALE
operators located on the equipment, who may come in contact with the equipment, the load line, or the load must be insulated or guarded from the equipment, the load line, and the load through an additional means other than the device described in paragraph (d)(4)(v)(A) of this section. Insulating gloves rated for the voltage involved are adequate additional means of protection for the purposes of this paragraph.		
(5) Nonconductive rigging if the rigging may be within the Table A of § 1926.1408 distance during the operation.		
(6) If the equipment is equipped with a device that automatically limits range of movement, it must be used and set to prevent any part of the equipment, load line, or load (including rigging and lifting accessories) from breaching the minimum approach distance established under paragraph (c) of this section.		
(7) If a tag line is used, it must be of the nonconductive type. (8) Barricades forming a perimeter at least 10 feet away from the equipment to prevent unauthorized personnel from entering the work area. In areas where obstacles prevent the barricade from being at least 10 feet away, the barricade must be as far from the equipment as feasible.		
(9) Workers other than the operator must be prohibited from touching the load line above the insulating link/device and crane. Operators remotely operating the equipment from the ground must use either wireless controls that isolate the operator from the equipment or		

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FEDERAL: §1926	STATE:	RATIONALE
insulating mats that insulate the operator from the ground. (10) Only personnel essential to the operation are permitted to be in the area of the crane and load. (11) The equipment must be properly grounded. (12) Insulating line hose or cover-up must be installed by the utility owner/operator except where such devices are unavailable for the line voltages involved.		
(e) The procedures developed to comply with paragraph (d) of this section are documented and immediately available on-site.		
(f) The equipment user and utility owner/ operator (or registered professional engineer) meet with the equipment operator and the other workers who will be in the area of the equipment or load to review the procedures that will be implemented to prevent breaching the minimum approach distance established in paragraph (c) of this section and prevent electrocution.		
(g) The procedures developed to comply with paragraph (d) of this section are implemented.		
(h) The utility owner/operator (or registered professional engineer) and all employers of employees involved in the work must identify one person who will direct the implementation of the procedures. The person identified in accordance with this paragraph must direct the implementation of the procedures and must have the authority to stop work at any time to ensure safety. (i) [Reserved.]		

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FEDERAL: §1926	STATE:	RATIONALE
(j) If a problem occurs implementing the procedures being used to comply with paragraph (d) of this section, or indicating that those procedures are inadequate to prevent electrocution, the employer must safely stop operations and either develop new procedures to comply with paragraph (d) of this section or have the utility owner/operator deenergize and visibly ground or relocate the power line before resuming work.		
(k) Devices originally designed by the manufacturer for use as a safety device (see § 1926.1415), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, must comply with the manufacturer's procedures for use and conditions of use. (l) [Reserved.]		
(m) The employer must train each operator and crew member assigned to work with the equipment in accordance with § 1926.1408(g).		
§ 1926.1411 Power line safety—while traveling under or near power lines with no load.	§4991.2. Power Line Safety – While Traveling Under or Near Power Lines with No Load.	
(a) This section establishes procedures and criteria that must be met for equipment traveling under or near a power line on a construction site with no load. Equipment traveling on a construction site with a load is governed by §§ 1926.1408, 1926.1409 or 1926.1410, whichever is appropriate, and § 1926.1417(u).	(a) This section establishes procedures and criteria that shall be met for equipment traveling under or near a power line on a construction site with no load. Equipment traveling on a construction site with a load is governed by Sections 5003.1, 5003.2 or 5003.3, whichever is appropriate, and §4991. (1) The provisions of Electrical Safety Orders, Group 2, Article 37, shall also apply to any	Subsection (a)(1) added to assure that provisions of California High-Voltage Electrical Safety Orders, which apply to all work in proximity to overhead lines, are not negated or superseded by this section.

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FEDERAL: §1926	STATE:	RATIONALE
	work in proximity to overhead power lines where more protective.	
(b) The employer must ensure that: (1) The boom/mast and boom/mast support system are lowered sufficiently to meet the requirements of this paragraph. (2) The clearances specified in Table T of this section are maintained. (3) The effects of speed and terrain on equipment movement (including movement of the boom/mast) are considered so that those effects do not cause the minimum clearance distances specified in Table T of this section to be breached. (4) Dedicated spotter. If any part of the equipment while traveling will get closer than 20 feet to the power line, the employer must ensure that a dedicated spotter who is in continuous contact with the driver/operator is used. The dedicated spotter must: (i) Be positioned to effectively gauge the clearance distance. (ii) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (iii) Give timely information to the operator so that the required clearance distance can be maintained. (5) Additional precautions for traveling in poor visibility. When traveling at night, or in conditions of poor visibility, in addition to the measures specified in paragraphs (b)(1) through (4) of this section, the employer must ensure that:	(b) The employer shall ensure that: (1) The boom/mast and boom/mast support system are lowered sufficiently to meet the requirements of this section. (2) The clearances specified in Table T of this section are maintained. (3) The effects of speed and terrain on equipment movement (including movement of the boom/mast) are considered so that those effects do not cause the minimum clearance distances specified in Table T of this section to be breached. (4) Dedicated spotter. If any part of the equipment while traveling will get closer than 20 feet to the power line, the employer shall ensure that a dedicated spotter who is in continuous contact with the driver/operator is used. The dedicated spotter shall: (A) Be positioned to effectively gauge the clearance distance. (B) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (C) Give timely information to the operator so that the required clearance distance can be maintained. (5) Additional precautions for traveling in poor visibility. When traveling at night, or in conditions of poor visibility, in addition to the measures specified in subsections (b)(1) through (4), the employer shall ensure that: (A) The power lines are illuminated or another	

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<table>
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<tr><td>(i) The power lines are illuminated or another means of identifying the location of the lines is used.
(ii) A safe path of travel is identified and used.</td><td>means of identifying the location of the lines is used.
(B) A safe path of travel is identified and used.</td><td></td></tr>
<tr><td>TABLE T—MINIMUM CLEARANCE DISTANCES WHILE TRAVELING WITH NO LOAD
Voltage
(nominal, kV, alternating current)
While traveling—minimum clearance distance (feet)
up to 0.75
..... 4
over .75 to 50
..... 6
over 50 to 345
..... 10
over 345 to 750
..... 16
Over 750 to 1,000
..... 20
Over 1,000
.....
(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).</td><td>TABLE T—MINIMUM CLEARANCE DISTANCES WHILE TRAVELING WITH NO LOAD
<table><tr><th>Voltage (nominal, kV, alternating current)</th><th>While traveling—minimum clearance distance (feet)</th></tr><tr><td>up to 0.60</td><td>4</td></tr><tr><td>over .60 to 50</td><td>6</td></tr><tr><td>over 50 to 345</td><td>10</td></tr><tr><td>over 345 to 750</td><td>16</td></tr><tr><td>Over 750 to 1,000</td><td>20</td></tr><tr><td>Over 1,000</td><td>(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).</td></tr></table></td><td>Clearances below 750 Volts coordinated with CA Section 2946, Table 1, which is more protective.</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>§ 1926.1412 Inspections.</td><td>§5031.5. Inspections – Modified Equipment.</td><td></td></tr>
<tr><td>(a) Modified equipment.
(1) Equipment that has had modifications or additions which affect the safe operation of the equipment (such as modifications or additions involving a safety device or operational aid, critical part of a control system, power plant, braking system, load sustaining structural components, load hook, or in-use operating mechanism) or capacity must be inspected by a qualified person after such modifications/ additions have been completed, prior to initial use. The inspection must meet all of the following requirements:
(i) The inspection must assure that the modifications or additions have been done in</td><td>(a) Equipment that has had modifications or additions which affect the safe operation of the equipment (such as modifications or additions involving a safety device or operational aid, critical part of a control system, power plant, braking system, load sustaining structural components, load hook, or in-use operating mechanism) or capacity shall be inspected by a certificating agency after such modifications/ additions have been completed, prior to initial use. The inspection shall meet all of the following requirements:

(1) The inspection shall assure that the modifications or additions have been done in</td><td>CA requires these inspections to be performed by a certified agent on cranes exceeding 3 tons rated capacity.</td></tr>
</table>

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FEDERAL: §1926	STATE:	RATIONALE
accordance with the approval obtained pursuant to § 1926.1434 (Equipment modifications). (ii) The inspection must include functional testing of the equipment. (2) Equipment must not be used until an inspection under this paragraph demonstrates that the requirements of paragraph (a)(1)(i) of this section have been met.	accordance with the approval obtained pursuant to §5027 (Equipment Modifications). (2) The inspection shall include functional testing of the equipment. EXCEPTION: These inspections may be performed by a qualified person for cranes not exceeding 3 tons rated capacity. (b) Equipment shall not be used until an inspection under this section demonstrates that the requirements of subsection (a)(1) have been met.	
(b) Repaired/adjusted equipment. (1) Equipment that has had a repair or adjustment that relates to safe operation (such as: A repair or adjustment to a safety device or operator aid, or to a critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or inuse operating mechanism), must be inspected by a qualified person after such a repair or adjustment has been completed, prior to initial use. The inspection must meet all of the following requirements: (i) The qualified person must determine if the repair/adjustment meets manufacturer equipment criteria (where applicable and available). (ii) Where manufacturer equipment criteria are unavailable or inapplicable, the qualified person must: (A) Determine if a registered professional engineer (RPE) is needed to develop criteria for the repair/adjustment. If an RPE is not needed, the employer must ensure that the criteria are	§5034.1. Inspections – Repaired/Adjusted Equipment. (a) Equipment that has had a repair or adjustment that relates to safe operation (such as: A repair or adjustment to a safety device or operator aid, or to a critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism), shall be inspected by a qualified person or certificating agency after such a repair or adjustment has been completed, prior to initial use. The inspection shall meet all of the following requirements: (1) The qualified person or certificating agency shall determine if the repair/adjustment meets manufacturer equipment criteria (where applicable and available). (2) Where manufacturer equipment criteria are unavailable or inapplicable, the qualified person or certificating agency shall: (A) Determine if a registered professional engineer (RPE) is needed to develop criteria for the repair/adjustment. If an RPE is not needed,	

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FEDERAL: §1926	STATE:	RATIONALE
developed by the qualified person. If an RPE is needed, the employer must ensure that they are developed by an RPE. (B) Determine if the repair/adjustment meets the criteria developed in accordance with paragraph (b)(1)(ii)(A) of this section. (iii) The inspection must include functional testing of the repaired/adjusted parts and other components that may be affected by the repair/adjustment. (4) Equipment must not be used until an inspection under this paragraph demonstrates that the repair/adjustment meets the requirements of paragraph (b)(1)(i) of this section (or, where applicable, paragraph (b)(1)(ii) of this section).	the employer shall ensure that the criteria are developed by the certified agent. If an RPE is needed, the employer shall ensure that they are developed by an RPE. (B) Determine if the repair/adjustment meets the criteria developed in accordance with subsection (a)(2)(A). (3) The inspection shall include functional testing of the repaired/adjusted parts and other components that may be affected by the repair/adjustment. (b) Equipment shall not be used until an inspection under this section demonstrates that the repair/adjustment meets the requirements of subsection (a)(1) [or, where applicable, subsection (a)(2)]. NOTES: 1. These inspections may be performed by a qualified person for cranes not exceeding 3 tons rated capacity. 2. Proof load tests are required in the case of major modifications or repairs to important structural components, see Section 5022.	
(c) Post-assembly. (1) Upon completion of assembly, the equipment must be inspected by a qualified person to assure that it is configured in accordance with manufacturer equipment criteria. (2) Where manufacturer equipment criteria are unavailable, a qualified person must: (i) Determine if a registered professional engineer (RPE) familiar with the type of equipment involved is needed to develop criteria for the equipment configuration. If an	§5031.6. Inspections – Post-Assembly. (a) Upon completion of assembly, the equipment shall be inspected by a qualified person or certificating agency to assure that it is configured in accordance with manufacturer equipment criteria. (b) Where manufacturer equipment criteria are unavailable, a qualified person or certificating agency shall: (1) Determine if a registered professional engineer (RPE) familiar with the type of equipment involved is needed to develop	

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FEDERAL: §1926	STATE:	RATIONALE
RPE is not needed, the employer must ensure that the criteria are developed by the qualified person. If an RPE is needed, the employer must ensure that they are developed by an RPE. (ii) Determine if the equipment meets the criteria developed in accordance with paragraph (c)(2)(i) of this section. (3) Equipment must not be used until an inspection under this paragraph demonstrates that the equipment is configured in accordance with the applicable criteria.	criteria for the equipment configuration. If an RPE is not needed, the employer shall ensure that the criteria are developed by the certified agent. If an RPE is needed, the employer shall ensure that they are developed by an RPE. (2) Determine if the equipment meets the criteria developed in accordance with subsection (b)(1). (c) Equipment shall not be used until an inspection under this paragraph demonstrates and documents that the equipment is configured in accordance with the applicable criteria. EXCEPTION: These inspections may be performed by a qualified person for cranes not exceeding 3 tons rated capacity.	
	§5031. Inspections – Daily.	
(d) Each shift. (1) A competent person must begin a visual inspection prior to each shift the equipment will be used, which must be completed before or during that shift.	(a) Each shift. A qualified person shall visually inspect the crane's or derrick's controls, rigging and operating mechanism prior to the first operation on any work shift.	CA is more protective – requires the inspection to be completed prior to first operation on any work shift.
The inspection must consist of observation for apparent deficiencies. Taking apart equipment components and booming down is not required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitating taking apart equipment components or booming down is needed.	The inspection shall consist of observation for apparent deficiencies. Taking apart equipment components and booming down is not required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitating taking apart equipment components or booming down is needed.	
Determinations made in conducting the inspection must be reassessed in light of observations made during operation.	Any unsafe conditions disclosed by the inspection requirements of this Article shall be corrected promptly. Defective components of equipment which create an imminent safety	CA more protective – repairs must be made prior to use.

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FEDERAL: §1926	STATE:	RATIONALE
	hazard shall be replaced, repaired or adjusted prior to use.	
At a minimum the inspection must include all of the following:	~~(b) Frequency of Inspections. Daily visual inspections by the operator or other qualified person shall be made of/for:~~ At a minimum the inspection shall include all of the following:	
(i) Control mechanisms for maladjustments interfering with proper operation.	(1) All functional mechanisms for maladjustment interfering with proper operation; (A) Control mechanisms shall be inspected for maladjustments interfering with proper operation.	
(ii) Control and drive mechanisms for apparent excessive wear of components and contamination by lubricants, water or other foreign matter.	(B) Control and drive mechanisms shall be inspected for apparent excessive wear of components and contamination by lubricants, water or other foreign matter.	
	(2) The operation of all limit switches without a load on the hook;	
(iii) Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those which flex in normal operation. (iv) Hydraulic system for proper fluid level.	(3) Lines, tanks, valves, pumps, and other parts of air or hydraulic systems for deterioration or leakage;	
(v) Hooks and latches for deformation, cracks, excessive wear, or damage such as from chemicals or heat.	(4) ~~Hooks for deformation and cracks;~~ Hooks and latches for deformation, cracks, excessive wear, or damage such as from chemicals or heat.	
	(5) Hoist or load attachment chains including end connections for excessive wear, twist, distorted or stretched links interfering with proper function;	
(vi) Wire rope reeving for compliance with the manufacturer's specifications. (vii) Wire rope, in accordance with §	(6) Excessive wear, broken wires, stretch, kinking, or twisting of ropes and rope slings, including end connections. Wire rope shall be	

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FEDERAL: §1926	STATE:	RATIONALE
1926.1413(a).	inspected in accordance with §5036(a). (7) Wire rope reeving shall be inspected for compliance with the manufacturer's specifications.	
(viii) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation. (ix) Tires (when in use) for proper inflation and condition. (x) Ground conditions around the equipment for proper support, including ground settling under and around outriggers/stabilizers and supporting foundations, ground water accumulation, or similar conditions. This paragraph does not apply to the inspection of ground conditions for railroad tracks and their underlying support when the railroad tracks are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213. (xi) The equipment for level position within the tolerances specified by the equipment manufacturer's recommendations, both before each shift and after each move and setup. (xii) Operator cab windows for significant cracks, breaks, or other deficiencies that would hamper the operator's view. (xiii) Rails, rail stops, rail clamps and supporting surfaces when the equipment has rail traveling. This paragraph does not apply to the inspection of rails, rail stops, rail clamps and supporting surfaces when the railroad tracks are part of the general railroad system of	(8) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation. (9) Tires (when in use) for proper inflation and condition. (10) Ground conditions around the equipment for proper support, including ground settling under and around outriggers/stabilizers and supporting foundations, ground water accumulation, or similar conditions. This section does not apply to the inspection of ground conditions for railroad tracks and their underlying support when the railroad tracks are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213. (11) The equipment for level position within the tolerances specified by the equipment manufacturer's recommendations, both before each shift and after each move and setup. (12) Operator cab windows for significant cracks, breaks, or other deficiencies that would hamper the operator's view. (13) Rails, rail stops, rail clamps and supporting surfaces when the equipment has rail traveling. This section does not apply to the inspection of rails, rail stops, rail clamps and supporting surfaces when the railroad tracks are part of the general railroad system of transportation that is	

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transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213. (xiv) Safety devices and operational aids for proper operation.	regulated pursuant to the Federal Railroad Administration under 49 CFR part 213. (14) Safety devices and operational aids for proper operation.	
(2) If any deficiency in paragraphs (d)(1)(i) through (xiii) of this section (or in additional inspection items required to be checked for specific types of equipment in accordance with other sections of this standard) is identified, an immediate determination must be made by the competent person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, the equipment must be taken out of service until it has been corrected. See § 1926.1417.	(b) If any deficiency in subsections (a)(1) through (13) (or in additional inspection items required to be checked for specific types of equipment in accordance with other sections of this standard) is identified, an immediate determination shall be made by the qualified person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, the equipment shall be taken out of service until it has been corrected.	
(3) If any deficiency in paragraph (d)(1)(xiv) of this section (safety devices/operational aids) is identified, the action specified in § 1926.1415 and § 1926.1416 must be taken prior to using the equipment.	(c) If any deficiency in subsection (a)(14) (safety devices/operational aids) is identified, the action specified in §5015 and §5016 shall be taken prior to using the equipment.	
(e) Monthly.	§5031. 1. Inspections – Monthly.	
(1) Each month the equipment is in service it must be inspected in accordance with paragraph (d) of this section (each shift). (2) Equipment must not be used until an inspection under this paragraph demonstrates that no corrective action under paragraphs (d)(2) and (3) of this section is required. (3) Documentation. (i) The following information must be documented and maintained by the employer that conducts the inspection: (A) The items checked and the results of the	(a) Each month the equipment is in service it shall be inspected in accordance with Section 5031 (Daily/Each Shift). (b) Equipment shall not be used until an inspection under this section demonstrates that no corrective action under Section 5031(b) and (c) is required. (c) Documentation. (1) The following information shall be documented and maintained by the employer that conducts the inspection: (A) The items checked and the results of the	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
inspection. (B) The name and signature of the person who conducted the inspection and the date. (ii) This document must be retained for a minimum of three months.	inspection. (B) The name and signature of the person who conducted the inspection and the date. (2) This document shall be retained for a minimum of three months.	
(f) Annual/comprehensive.	§5031. 2. Inspections – Annual/Comprehensive.	
(1) At least every 12 months the equipment must be inspected by a qualified person in accordance with paragraph (d) of this section (each shift) except that the corrective action set forth in paragraphs (f)(4), (f)(5), and (f)(6) of this section must apply in place of the corrective action required by paragraphs (d)(2) and (d)(3) of this section.	(a) At least every 12 months the equipment shall be inspected by a licensed certificating agency in accordance with Section 5031 (Daily/each shift) except that the corrective action set forth in subsections (d), (e) and (f) shall apply in place of the corrective action required by Section 5031(b) and (c). (1) Such examinations shall be made not later than the anniversary date of the quadrennial certification.	
(2) In addition, at least every 12 months, the equipment must be inspected by a qualified person.	(b) In addition, at least every 12 months, equipment shall be inspected by a certificating agency.	Cranes exceeding 3 tons capacity must be inspected by a certified agent per California Title 8, Section 5021 and per California Labor Code Section 7375.
Disassembly is required, as necessary, to complete the inspection. The equipment must be inspected for all of the following:	Disassembly is required, as necessary, to complete the inspection; however, whenever it is practical and advisable to avoid disassembly of equipment, removal of pins, etc., examination of structure or parts by electronic, ultrasonic, or other nondestructive methods shall be carried out. The equipment shall be inspected for all of the following:	Provision for NDT added (relocated from 5031(d)(4).
(i) Equipment structure (including the boom and, if equipped, the jib): (A) Structural members: Deformed, cracked, or significantly corroded. (B) Bolts, rivets and other fasteners: loose,	(1) Equipment structure (including the boom and, if equipped, the jib): (A) Structural members: Deformed, cracked, or significantly corroded. (B) Bolts, rivets and other fasteners: loose,	*[Ed note: Replaces 5022(d)(6), (7), (8) & (12)]*

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
failed or significantly corroded. (C) Welds for cracks.	failed or significantly corroded. (C) Welds for cracks. (D) Junction areas of removable boom sections, particularly for proper seating, cracks, deformities, or other defects in securing bolts and in the vicinity of such bolts.	
(ii) Sheaves and drums for cracks or significant wear. (iii) Parts such as pins, bearings, shafts, gears, rollers and locking devices for distortion, cracks or significant wear.	(2) All functional operating mechanisms for improper function, maladjustment, and excessive component wear, with particular attention to the following: (A) Sheaves and drums for cracks or significant wear. (B) Parts such as pins, bearings, shafts, gears, rollers and locking devices for distortion, cracks or significant wear. NOTE: This shall include operation with partial load, in which all functions and movements, including, where applicable, maximum possible rotation in both directions, are performed.	*[Ed note: Relocated from 5022(d)(1)]*
(iv) Brake and clutch system parts, linings, pawls and ratchets for excessive wear.	(3) Excessive wear on and free operation of brake and clutch system parts, linings, pawls, and ratchets.	*[Ed note: Relocated from 5022(d)(9)]*
(v) Safety devices and operational aids for proper operation (including significant inaccuracies).	(4) Safety devices and operational aids for proper operation (including significant inaccuracies).	*[Ed note: Replaces 5022(d)(2)]*
(vi) Gasoline, diesel, electric, or other power plants for safety-related problems (such as leaking exhaust and emergency shut-down feature) and conditions, and proper operation.	(5) Gasoline, diesel, electric, or other power plants for safety-related problems (such as leaking exhaust and emergency shut-down feature) and conditions, and proper operation.	
(vii) Chains and chain drive sprockets for excessive wear of sprockets and excessive chain stretch.	(6) Chains and chain drive sprockets for excessive wear of sprockets and excessive chain stretch.	
(viii) Travel steering, brakes, and locking devices, for proper operation.	(7) Travel steering, brakes, and locking devices, for proper operation.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(ix) Tires for damage or excessive wear.	(8) Tires for damage or excessive wear.	
(x) Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, as follows: (A) Flexible hose or its junction with the fittings for indications of leaks. (B) Threaded or clamped joints for leaks. (C) Outer covering of the hose for blistering, abnormal deformation or other signs of failure/impending failure. (D) Outer surface of a hose, rigid tube, or fitting for indications of excessive abrasion or scrubbing.	(9) Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, as follows: (A) Flexible hose or its junction with the fittings for indications of leaks. (B) Threaded or clamped joints for leaks. (C) Outer covering of the hose for blistering, abnormal deformation or other signs of failure/impending failure. (D) Outer surface of a hose, rigid tube, or fitting for indications of excessive abrasion or scrubbing.	
(xi) Hydraulic and pneumatic pumps and motors, as follows: (A) Performance indicators: Unusual noises or vibration, low operating speed, excessive heating of the fluid, low pressure. (B) Loose bolts or fasteners. (C) Shaft seals and joints between pump sections for leaks.	(10) Hydraulic and pneumatic pumps and motors, as follows: (A) Performance indicators: Unusual noises or vibration, low operating speed, excessive heating of the fluid, low pressure. (B) Loose bolts or fasteners. (C) Shaft seals and joints between pump sections for leaks.	
(xii) Hydraulic and pneumatic valves, as follows: (A) Spools: Sticking, improper return to neutral, and leaks. (B) Leaks. (C) Valve housing cracks. (D) Relief valves: Failure to reach correct pressure (if there is a manufacturer procedure for checking pressure, it must be followed).	(11) Hydraulic and pneumatic valves, as follows: (A) Spools: Sticking, improper return to neutral, and leaks. (B) Leaks. (C) Valve housing cracks. (D) Relief valves: Failure to reach correct pressure (if there is a manufacturer procedure for checking pressure, it shall be followed).	
(xiii) Hydraulic and pneumatic cylinders, as follows: (A) Drifting caused by fluid leaking across the piston. (B) Rod seals and welded joints for leaks.	(12) Hydraulic and pneumatic cylinders, as follows: (A) Drifting caused by fluid leaking across the piston. (B) Rod seals and welded joints for leaks.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(C) Cylinder rods for scores, nicks, or dents. (D) Case (barrel) for significant dents. (E) Rod eyes and connecting joints: Loose or deformed.	(C) Cylinder rods for scores, nicks, or dents. (D) Case (barrel) for significant dents. (E) Rod eyes and connecting joints: Loose or deformed.	
(xiv) Outrigger or stabilizer pads/floats for excessive wear or cracks.	(13) Outrigger or stabilizer pads/floats for excessive wear or cracks.	
(xv) Slider pads for excessive wear or cracks.	(14) Slider pads for excessive wear or cracks	
(xvi) Electrical components and wiring for cracked or split insulation and loose or corroded terminations.	(15) Electrical components and wiring for cracked or split insulation and loose or corroded terminations.	
(xvii) Warning labels and decals originally supplied with the equipment by the manufacturer or otherwise required under this standard: Missing or unreadable.	(16) Warning labels and decals originally supplied with the equipment by the manufacturer or otherwise required under this standard: Missing or unreadable. (A) It shall be ascertained that there is a durable rating chart visible to the operator, covering the complete range of the certified agent's capacity ratings at all operating radii, for all permissible boom lengths and jib length, with alternate ratings for optional equipment affecting such ratings. Necessary precautions or warnings shall be included and operating controls marked or an explanation of controls shall be posted at the operator's position to indicate function.	*[Ed note: (16)(i) relocated from 5022(d)(11)]*
(xviii) Originally equipped operator seat (or equivalent): Missing. (xix) Operator seat: Unserviceable.	(17) Originally equipped operator seat (or equivalent): Missing or unserviceable.	
(xx) Originally equipped steps, ladders, handrails, guards: Missing. (xxi) Steps, ladders, handrails, guards: In unusable/unsafe condition.		
	(18) Load, boom angle, or other indicators shall be checked for any inaccuracy.	*[Ed note: Relocated from 5022(d)(10)]*
	(19) Loose gear components (i.e. hooks, etc.),	*[Ed note: Relocated from 5022(d)(4) and*

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	including wire rope and wire rope terminals and connections, with particular attention to sections of wire rope exposed to abnormal wear and sections not normally exposed for examination. (A) Crane hooks with cracks or with deformation of throat opening more than 15 percent in excess of normal opening or more than 10 degree twist from plane of unbent hook shall be removed from service.	*supplemented with 5031(d)(1)]*
	(20) Rope reeving for compliance with certified agent's recommendations.	*[Ed note: Relocated from 5022(d)(5)]*
	(21) It shall be ascertained that no counterweights in excess of the certified agent's specifications are fitted.	*[Ed note: Relocated from 5022(d)(13)]*
	(22) Such other examinations deemed necessary under the circumstances.	*[Ed note: Relocated from 5022(d)(14)]*
(3) This inspection must include functional testing to determine that the equipment as configured in the inspection is functioning properly.	(c) This inspection shall include functional testing to determine that the equipment as configured in the inspection is functioning properly.	
(4) If any deficiency is identified, an immediate determination must be made by the qualified person as to whether the deficiency constitutes a safety hazard or, though not yet a safety hazard, needs to be monitored in the monthly inspections.	(d) If any deficiency is identified, an immediate determination shall be made by the certificating agency as to whether the deficiency constitutes a safety hazard or, though not yet a safety hazard, needs to be monitored in the monthly inspections.	
(5) If the qualified person determines that a deficiency is a safety hazard, the equipment must be taken out of service until it has been corrected, except when temporary alternative measures are implemented as specified in § 1926.1416(d) or § 1926.1435(e). See §	(e) If the certificating agency determines that a deficiency is a safety hazard, the equipment shall be taken out of service until it has been corrected, except when temporary alternative measures are implemented as specified in §5016(d), or §4968.1.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
1926.1417.		
(6) If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer must ensure that the deficiency is checked in the monthly inspections.	(f) If the certified agent determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer shall ensure that the deficiency is checked in the monthly inspections.	
(7) Documentation of annual/comprehensive inspection. The following information must be documented, maintained, and retained for a minimum of 12 months, by the employer that conducts the inspection: (i) The items checked and the results of the inspection. (ii) The name and signature of the person who conducted the inspection and the date.	(g) Documentation of annual/comprehensive inspection. (1) The following information shall be documented, maintained, and retained for a minimum of 12 months, by the employer that conducts the inspection: (A) The items checked and the results of the inspection. (B) The name and signature of the person who conducted the inspection and the date.	
	EXCEPTION: Annual/Comprehensive inspections of Section 5031.2 may be performed by a qualified person for cranes not exceeding 3 tons rated capacity.	
	(2) Records required for crane certification shall be maintained in accordance with the provisions of T8CCR Section 344.80.	
(g) Severe service. Where the severity of use/ conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), the employer must stop using the equipment and a qualified person must: (1) Inspect the equipment for structural damage to determine if the equipment can continue to	§5031.3. Inspections – Severe Service. Where the severity of use/conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), the employer shall stop using the equipment and a certified agent shall: (a) Inspect the equipment for structural damage to determine if the equipment can continue to	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
be used safely. (2) In light of the use/conditions determine whether any items/conditions listed in paragraph (f) of this section need to be inspected; if so, the qualified person must inspect those items/conditions. (3) If a deficiency is found, the employer must follow the requirements in paragraphs (f)(4) through (6) of this section.	be used safely. (b) In light of the use/conditions determine whether any items/conditions listed in Section 5031.2 need to be inspected; if so, the certified agent shall inspect those items/conditions. (c) If a deficiency is found, the employer shall follow the requirements in subsections 5031.2(d) through (f).	
(h) Equipment not in regular use. Equipment that has been idle for 3 months or more must be inspected by a qualified person in accordance with the requirements of paragraph (e) (Monthly) of this section before initial use. (i) [Reserved.]	§5031.4. Inspections – Equipment Not in Regular Use. (a) Equipment that has been idle for 3 months or more shall be inspected by a certificating agency or qualified person in accordance with the requirements of Section 5031.1 (Inspections – Monthly), before initial use.	
(j) Any part of a manufacturer's procedures regarding inspections that relate to safe operation (such as to a safety device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in use operating mechanism) that is more comprehensive or has a more frequent schedule of inspection than the requirements of this section must be followed. (k) All documents produced under this section must be available, during the applicable document retention period, to all persons who conduct inspections under this section.	§5032. ~~Molten Metal Cranes. [Repealed]~~ Inspections – General. (a) Any part of a manufacturer's procedures regarding inspections that relate to safe operation (such as to a safety device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) that is more comprehensive or has a more frequent schedule of inspection than the requirements of this Article shall be followed. (b) All documents produced under this Article shall be available, during the applicable document retention period, to all persons who conduct inspections under this Article.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
§ 1926.1413 Wire rope—inspection.	§5036. Wire Rope Inspections.	
(a) Shift inspection. (1) A competent person must begin a visual inspection prior to each shift the equipment is used, which must be completed before or during that shift.	(a) Shift inspection. (1) A qualified person shall visually inspect the crane's or derrick's wire rope and rigging prior to the first operation on any work shift. Any unsafe conditions disclosed by the inspection requirements of this Article shall be corrected promptly. Defective components of equipment which create an imminent safety hazard shall be replaced, repaired or adjusted prior to use.	Copied from section 5031 which includes inspection of controls, rigging and operating mechanisms. Since federal version has a separate section for rigging (including wire rope), portions of Section 5031 are repeated here as applicable. CA standard requires the inspection to be completed prior to the first operation.
The inspection must consist of observation of wire ropes (running and standing) that are likely to be in use during the shift for apparent deficiencies, including those listed in paragraph (a)(2) of this section. Untwisting (opening) of wire rope or booming down is not required as part of this inspection.	The inspection shall consist of observation of wire ropes (running and standing) that are likely to be in use during the shift for apparent deficiencies, including those listed in subsection (a)(2). Untwisting (opening) of wire rope or booming down is not required as part of this inspection.	
(2) Apparent deficiencies. (i) Category I. Apparent deficiencies in this category include the following: (A) Significant distortion of the wire rope structure such as kinking, crushing, unstranding, birdcaging, signs of core failure or steel core protrusion between the outer strands. (B) Significant corrosion. (C) Electric arc damage (from a source other than power lines) or heat damage. (D) Improperly applied end connections. (E) Significantly corroded, cracked, bent, or worn end connections (such as from severe service).	(2) Apparent deficiencies. (A) Category I. Apparent deficiencies in this category include the following: 1. Significant distortion of the wire rope structure such as kinking, crushing, unstranding, birdcaging, signs of core failure or steel core protrusion between the outer strands. 2. Significant corrosion. 3. Electric arc damage (from a source other than power lines) or heat damage. 4. Improperly applied end connections. 5. Significantly corroded, cracked, bent, or worn end connections (such as from severe service).	
(ii) Category II. Apparent deficiencies in this category are: (A) Visible broken wires, as follows:	(B) Category II. Apparent deficiencies in this category are: 1. Visible broken wires, as follows:	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(1) In running wire ropes: Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay, where a rope lay is the length along the rope in which one strand makes a complete revolution around the rope. (2) In rotation resistant ropes: Two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters. (3) In pendants or standing wire ropes: More than two broken wires in one rope lay located in rope beyond end connections and/or more than one broken wire in a rope lay located at an end connection. (B) A diameter reduction of more than 5% from nominal diameter.	a. In running wire ropes: Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay, where a rope lay is the length along the rope in which one strand makes a complete revolution around the rope. b. In rotation resistant ropes: Two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters. c. In pendants or standing wire ropes: More than two broken wires in one rope lay located in rope beyond end connections and/or more than one broken wire in a rope lay located at an end connection. 2. A diameter reduction of more than 5% from nominal diameter.	
(iii) Category III. Apparent deficiencies in this category include the following: (A) In rotation resistant wire rope, core protrusion or other distortion indicating core failure. (B) Prior electrical contact with a power line. (C) A broken strand.	(C) Category III. Apparent deficiencies in this category include the following: 1. In rotation resistant wire rope, core protrusion or other distortion indicating core failure. 2. Prior electrical contact with a power line. 3. A broken strand.	
(3) Critical review items. The competent person must give particular attention to all of the following: (i) Rotation resistant wire rope in use. (ii) Wire rope being used for boom hoists and luffing hoists, particularly at reverse bends. (iii) Wire rope at flange points, crossover points and repetitive pickup points on drums. (iv) Wire rope at or near terminal ends. (v) Wire rope in contact with saddles, equalizer	(3) Critical review items. The qualified person shall give particular attention to all of the following: 1. Rotation resistant wire rope in use. 2. Wire rope being used for boom hoists and luffing hoists, particularly at reverse bends. 3. Wire rope at flange points, crossover points and repetitive pickup points on drums. 4. Wire rope at or near terminal ends. 5. Wire rope in contact with saddles, equalizer	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
sheaves or other sheaves where rope travel is limited.	sheaves or other sheaves where rope travel is limited.	
(4) Removal from service. (i) If a deficiency in Category I (see paragraph (a)(2)(i) of this section) is identified, an immediate determination must be made by the competent person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question must be prohibited until: (A) The wire rope is replaced (see § 1926.1417), or (B) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	(4) Removal from service. 1. If a deficiency in Category I [see subsection (a)(2)(A)] is identified, an immediate determination shall be made by the qualified person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question shall be prohibited until: a. The wire rope is replaced, or b. If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this section, the employer shall ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	
(ii) If a deficiency in Category II (see paragraph (a)(2)(ii) of this section) is identified, operations involving use of the wire rope in question must be prohibited until: (A) The employer complies with the wire rope manufacturer's established criterion for removal from service or a different criterion that the wire rope manufacturer has approved in writing for that specific wire rope (see § 1926.1417), (B) The wire rope is replaced (see § 1926.1417), or (C) If the deficiency is localized, the problem is	2. If a deficiency in Category II [see subsection (a)(2)(B)] is identified, operations involving use of the wire rope in question shall be prohibited until: a. The employer complies with the wire rope manufacturer's established criterion for removal from service or a different criterion that the wire rope manufacturer has approved in writing for that specific wire rope, b. The wire rope is replaced, or c. If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this section, the employer shall ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	
(iii) If a deficiency in Category III is identified, operations involving use of the wire rope in question must be prohibited until: (A) The wire rope is replaced (see § 1926.1417), or (B) If the deficiency (other than power line contact) is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. Repair of wire rope that contacted an energized power line is also prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	3. If a deficiency in Category III is identified, operations involving use of the wire rope in question shall be prohibited until: a. The wire rope is replaced, or b. If the deficiency (other than power line contact) is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. Repair of wire rope that contacted an energized power line is also prohibited. If a rope is shortened under this section, the employer shall ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	
(iv) Where a wire rope is required to be removed from service under this section, either the equipment (as a whole) or the hoist with that wire rope must be tagged-out, in accordance with § 1926.1417(f)(1), until the wire rope is repaired or replaced.	4. Where a wire rope is required to be removed from service under this section, either the equipment (as a whole) or the hoist with that wire rope shall be tagged-out, in accordance with §5008.1(f)(1), until the wire rope is repaired or replaced.	
(b) Monthly inspection.	(b) Monthly inspection.	
(1) Each month an inspection must be conducted in accordance with paragraph (a) (shift inspection) of this section.	(1) Each month an inspection shall be conducted in accordance with subsection (a) [Shift Inspection].	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(2) The inspection must include any deficiencies that the qualified person who conducts the annual inspection determines under paragraph (c)(3)(ii) of this section must be monitored. (3) Wire ropes on equipment must not be used until an inspection under this paragraph demonstrates that no corrective action under paragraph (a)(4) of this section is required. (4) The inspection must be documented according to § 1926.1412(e)(3) (monthly inspection documentation).	(2) The inspection shall include any deficiencies that the qualified person who conducts the annual inspection determines under subsection (c)(3)(B) shall be monitored. (3) Wire ropes on equipment shall not be used until an inspection under this section demonstrates that no corrective action under subsection (a)(4) is required. (4) The inspection shall be documented according to §5031.1(c) [monthly inspection documentation].	
(c) Annual/comprehensive.	(c) Annual/comprehensive.	
(1) At least every 12 months, wire ropes in use on equipment must be inspected by a qualified person in accordance with paragraph (a) of this section (shift inspection).	(1) At least every 12 months, wire ropes in use on equipment shall be inspected by a qualified person in accordance with subsection (a) [Shift Inspection].	
(2) In addition, at least every 12 months, the wire ropes in use on equipment must be inspected by a qualified person, as follows: (i) The inspection must be for deficiencies of the types listed in paragraph (a)(2) of this section. (ii) The inspection must be complete and thorough, covering the surface of the entire length of the wire ropes, with particular attention given to all of the following: (A) Critical review items listed in paragraph (a)(3) of this section. (B) Those sections that are normally hidden during shift and monthly inspections. (C) Wire rope subject to reverse bends. (D) Wire rope passing over sheaves. (iii) Exception: In the event an inspection under	(2) In addition, at least every 12 months, the wire ropes in use on equipment shall be inspected by a qualified person, as follows: (A) The inspection shall be for deficiencies of the types listed in subsection (a)(2). (B) The inspection shall be complete and thorough, covering the surface of the entire length of the wire ropes, with particular attention given to all of the following: 1. Critical review items listed in subsection (a)(3). 2. Those sections that are normally hidden during shift and monthly inspections. 3. Wire rope subject to reverse bends. 4. Wire rope passing over sheaves. EXCEPTION: In the event an inspection under	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
paragraph (c)(2) of this section is not feasible due to existing set-up and configuration of the equipment (such as where an assist crane is needed) or due to site conditions (such as a dense urban setting), such inspections must be conducted as soon as it becomes feasible, but no longer than an additional 6 months for running ropes and, for standing ropes, at the time of disassembly.	subsection (c)(2) is not feasible due to existing set-up and configuration of the equipment (such as where an assist crane is needed) or due to site conditions (such as a dense urban setting), such inspections shall be conducted as soon as it becomes feasible, but no longer than an additional 6 months for running ropes and, for standing ropes, at the time of disassembly.	
(3) If a deficiency is identified, an immediate determination must be made by the qualified person as to whether the deficiency constitutes a safety hazard. (i) If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question must be prohibited until: (A) The wire rope is replaced (see § 1926.1417), or (B) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position. (ii) If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer must ensure that the deficiency is checked in the monthly inspections.	(3) If a deficiency is identified, an immediate determination shall be made by the qualified person as to whether the deficiency constitutes a safety hazard. (A) If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question shall be prohibited until: 1. The wire rope is replaced, or 2. If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this section, the employer shall ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position. (B) If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer shall ensure that the deficiency is checked in the monthly inspections.	
(4) The inspection must be documented according to § 1926.1412(f)(7) (annual/comprehensive inspection	(4) The inspection shall be documented according to §5031.2(g) Inspections – Annual/ Comprehensive.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
documentation).		
(d) Rope lubricants that are of the type that hinder inspection must not be used. (e) All documents produced under this section must be available, during the applicable document retention period, to all persons who conduct inspections under this section.	(d) Rope lubricants that are of the type that hinder inspection shall not be used. (e) All documents produced under this section shall be available, during the applicable document retention period, to all persons who conduct inspections under this section.	
§ 1926.1414 Wire rope—selection and installation criteria.	§5037. Wire Rope—Selection and Installation Criteria.	
(a) Original equipment wire rope and replacement wire rope must be selected and installed in accordance with the requirements of this section. Selection of replacement wire rope must be in accordance with the recommendations of the wire rope manufacturer, the equipment manufacturer, or a qualified person.	(a) Original equipment wire rope and replacement wire rope shall be selected and installed in accordance with the requirements of this section. Selection of replacement wire rope shall be in accordance with the recommendations of the wire rope manufacturer, the equipment manufacturer, or a qualified person.	
(b) Wire rope design criteria: Wire rope (other than rotation resistant rope) must comply with either Option (1) or Option (2) of this section, as follows: (1) Option (1). Wire rope must comply with section 5–1.7.1 of ASME B30.5–2004 (incorporated by reference, see § 1926.6) except that section's paragraph (c) must not apply. (2) Option (2). Wire rope must be designed to have, in relation to the equipment's rated capacity, a sufficient minimum breaking force and design factor so that compliance with the applicable inspection provisions in § 1926.1413 will be an effective means of preventing sudden rope failure.	(b) Wire rope design criteria: Wire rope (other than rotation resistant rope) shall comply with either Option (1) or Option (2), as follows: (1) Option (1). Wire rope shall comply with section 5–1.7.1 of ASME B30.5–2004 except that subsection 5-1.7.1(c) shall not apply. (2) Option (2). Wire rope shall be designed to have, in relation to the equipment's rated capacity, a sufficient minimum breaking force and design factor so that compliance with the applicable inspection provisions in §5036 (Wire Rope Inspections) will be an effective means of preventing sudden rope failure.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(c) Wire rope must be compatible with the safe functioning of the equipment.	(c) Wire rope shall be compatible with the safe functioning of the equipment.	
(d) Boom hoist reeving. (1) Fiber core ropes must not be used for boom hoist reeving, except for derricks. (2) Rotation resistant ropes must be used for boom hoist reeving only where the requirements of paragraph (e)(4)(ii) of this section are met.	(d) Boom hoist reeving. (1) Fiber core ropes shall not be used for boom hoist reeving, except for derricks. (2) Rotation resistant ropes shall be used for boom hoist reeving only where the requirements of subsection (e)(4)(B) are met.	
(e) Rotation resistant ropes. (1) Definitions. (i) Type I rotation resistant wire rope (''Type I''). Type I rotation resistant rope is stranded rope constructed to have little or no tendency to rotate or, if guided, transmits little or no torque. It has at least 15 outer strands and comprises an assembly of at least three layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	(e) Rotation resistant ropes. (1) Definitions. (A) Type I rotation resistant wire rope ("Type I"). Type I rotation resistant rope is stranded rope constructed to have little or no tendency to rotate or, if guided, transmits little or no torque. It has at least 15 outer strands and comprises an assembly of at least three layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	
(ii) Type II rotation resistant wire rope (''Type II''). Type II rotation resistant rope is stranded rope constructed to have significant resistance to rotation. It has at least 10 outer strands and comprises an assembly of two or more layers of strands laid helically over a center in two or three operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	(B) Type II rotation resistant wire rope ("Type II"). Type II rotation resistant rope is stranded rope constructed to have significant resistance to rotation. It has at least 10 outer strands and comprises an assembly of two or more layers of strands laid helically over a center in two or three operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	
(iii) Type III rotation resistant wire rope (''Type III''). Type III rotation resistant rope is stranded rope constructed to have limited resistance to rotation. It has no more than nine outer strands, and comprises an assembly of	(C) Type III rotation resistant wire rope ("Type III"). Type III rotation resistant rope is stranded rope constructed to have limited resistance to rotation. It has no more than nine outer strands, and comprises an assembly of two layers of	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
two layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	
(2) Requirements. (i) Types II and III with an operating design factor of less than 5 must not be used for duty cycle or repetitive lifts. (ii) Rotation resistant ropes (including Types I, II and III) must have an operating design factor of no less than 3.5. (iii) Type I must have an operating design factor of no less than 5, except where the wire rope manufacturer and the equipment manufacturer approves the design factor, in writing. (iv) Types II and III must have an operating design factor of no less than 5, except where the requirements of paragraph (e)(3) of this section are met.	(2) Requirements. (A) Types II and III with an operating design factor of less than 5 shall not be used for duty cycle or repetitive lifts. (B) Rotation resistant ropes (including Types I, II and III) shall have an operating design factor of no less than 3.5. (C) Type I shall have an operating design factor of no less than 5, except where the wire rope manufacturer and the equipment manufacturer approves the design factor, in writing. (D) Types II and III shall have an operating design factor of no less than 5, except where the requirements of subsection (e)(3) are met.	
(3) When Types II and III with an operating design factor of less than 5 are used (for non-duty cycle, non-repetitive lifts), the following requirements must be met for each lifting operation: (i) A qualified person must inspect the rope in accordance with § 1926.1413(a). The rope must be used only if the qualified person determines that there are no deficiencies constituting a hazard. In making this determination, more than one broken wire in any one rope lay must be considered a hazard. (ii) Operations must be conducted in such a manner and at such speeds as to minimize	(3) When Types II and III with an operating design factor of less than 5 are used (for non-duty cycle, non-repetitive lifts), the following requirements shall be met for each lifting operation: (A) A qualified person shall inspect the rope in accordance with §5036(a). The rope shall be used only if the qualified person determines that there are no deficiencies constituting a hazard. In making this determination, more than one broken wire in any one rope lay shall be considered a hazard. (B) Operations shall be conducted in such a manner and at such speeds as to minimize	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
dynamic effects. (iii) Each lift made under § 1926.1414(e)(3) must be recorded in the monthly and annual inspection documents. Such prior uses must be considered by the qualified person in determining whether to use the rope again.	dynamic effects. (C) Each lift made under subsection(e)(3) shall be recorded in the monthly and annual inspection documents. Such prior uses shall be considered by the qualified person in determining whether to use the rope again.	
(4) *Additional requirements for rotation resistant ropes for boom hoist reeving.* (i) Rotation resistant ropes must not be used for boom hoist reeving, except where the requirements of paragraph (e)(4)(ii) of this section are met.	(4) Additional requirements for rotation resistant ropes for boom hoist reeving. (A) Rotation resistant ropes shall not be used for boom hoist reeving, except where the requirements of subsection (e)(4)(B) are met.	
(ii) Rotation resistant ropes may be used as boom hoist reeving when load hoists are used as boom hoists for attachments such as luffing attachments or boom and mast attachment systems. Under these conditions, all of the following requirements must be met:	(B) Rotation resistant ropes may be used as boom hoist reeving when load hoists are used as boom hoists for attachments such as luffing attachments or boom and mast attachment systems. Under these conditions, all of the following requirements shall be met:	
(A) The drum must provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used. (B) The requirements in § 1926.1426(a) (irrespective of the date of manufacture of the equipment), and § 1926.1426(b).	1. The drum shall provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used. 2. The requirements in §5002.1(a) (irrespective of the date of manufacture of the equipment), and §5002.1(b).	
(C) The requirements in ASME B30.5–2004 sections 5–1.3.2(a), (a)(2) through (a)(4), (b) and (d) (incorporated by reference, see § 1926.6) except that the minimum pitch diameter for sheaves used in multiple rope reeving is 18 times the nominal diameter of the rope used (instead of the value of 16 specified in section 5–1.3.2(d)).	(C) The requirements in ASME B30.5–2004 sections 5–1.3.2(a), (a)(2) through (a)(4), (b) and (d) except that the minimum pitch diameter for sheaves used in multiple rope reeving is 18 times the nominal diameter of the rope used (instead of the value of 16 specified in section 5–1.3.2(d)).	
(D) All sheaves used in the boom hoist reeving system must have a rope pitch diameter of not	(D) All sheaves used in the boom hoist reeving system shall have a rope pitch diameter of not	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
less than 18 times the nominal diameter of the rope used. (E) The operating design factor for the boom hoist reeving system must be not less than five. (F) The operating design factor for these ropes must be the total minimum breaking force of all parts of rope in the system divided by the load imposed on the rope system when supporting the static weights of the structure and the load within the equipment's rated capacity. (G) When provided, a power controlled lowering system must be capable of handling rated capacities and speeds as specified by the manufacturer.	less than 18 times the nominal diameter of the rope used. (E) The operating design factor for the boom hoist reeving system shall be not less than five. (F) The operating design factor for these ropes shall be the total minimum breaking force of all parts of rope in the system divided by the load imposed on the rope system when supporting the static weights of the structure and the load within the equipment's rated capacity. (G) When provided, a power controlled lowering system shall be capable of handling rated capacities and speeds as specified by the manufacturer.	
(f) Wire rope clips used in conjunction with wedge sockets must be attached to the unloaded dead end of the rope only, except that the use of devices specifically designed for deadending rope in a wedge socket is permitted. (g) Socketing must be done in the manner specified by the manufacturer of the wire rope or fitting. (h) Prior to cutting a wire rope, seizings must be placed on each side of the point to be cut. The length and number of seizings must be in accordance with the wire rope manufacturer's instructions.	(f) Wire rope clips used in conjunction with wedge sockets shall be attached to the unloaded dead end of the rope only, except that the use of devices specifically designed for deadending rope in a wedge socket is permitted. (g) Socketing shall be done in the manner specified by the manufacturer of the wire rope or fitting. (h) Prior to cutting a wire rope, seizings shall be placed on each side of the point to be cut. The length and number of seizings shall be in accordance with the wire rope manufacturer's instructions.	
§ 1926.1415 Safety devices.	§5015. Safety Devices.	
(a) Safety devices. The following safety devices are required on all equipment covered by this subpart, unless otherwise specified:	(a) Safety devices. The following safety devices are required on all equipment covered by Group 13, unless otherwise specified: NOTE: See Section 4968 for tower cranes.	
(1) Crane level indicator.	(1) Crane level indicator.	*[4924e]*

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(i) The equipment must have a crane level indicator that is either built into the equipment or is available on the equipment. (ii) If a built-in crane level indicator is not working properly, it must be tagged-out or removed. If a removable crane level indicator is not working properly, it must be removed. (iii) This requirement does not apply to portal cranes, derricks, floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation.	(A) The equipment shall have a crane level indicator that is either built into the equipment or is available on the equipment. (B) If a built-in crane level indicator is not working properly, it shall be tagged-out or removed. If a removable crane level indicator is not working properly, it shall be removed. (C) This requirement does not apply to portal cranes, derricks, floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation.	
(2) Boom stops, except for derricks and hydraulic booms. (3) Jib stops (if a jib is attached), except for derricks.	(2) Boom stops, except for derricks and hydraulic booms. (3) Jib stops (if a jib is attached), except for derricks.	*[4922]*
(4) Equipment with foot pedal brakes must have locks.	(4) Equipment with foot pedal brakes shall have locks.	*[4899, 4900]*
(5) Hydraulic outrigger jacks and hydraulic stabilizer jacks must have an integral holding device/check valve.	(5) Hydraulic outrigger jacks and hydraulic stabilizer jacks shall have an integral holding device/check valve.	
(6) Equipment on rails must have rail clamps and rail stops, except for portal cranes.	(6) Equipment on rails shall have rail clamps and rail stops, except for portal cranes.	
(7) Horn (i) The equipment must have a horn that is either built into the equipment or is on the equipment and immediately available to the operator. (ii) If a built-in horn is not working properly, it must be tagged-out or removed. If a removable horn is not working properly, it must be removed.	(7) Horn (A) The equipment shall have a horn that is either built into the equipment or is on the equipment and immediately available to the operator. (B) If a built-in horn is not working properly, it shall be tagged-out or removed. If a removable horn is not working properly, it shall be removed.	*[4889, 4936]*
(b) Proper operation required. Operations must not begin unless all of the devices listed in this section are in proper	(b) Proper operation required. Operations shall not begin unless all of the devices listed in this section are in proper	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
working order. If a device stops working properly during operations, the operator must safely stop operations. If any of the devices listed in this section are not in proper working order, the equipment must be taken out of service and operations must not resume until the device is again working properly. See § 1926.1417 (Operation). Alternative measures are not permitted to be used.	working order. If a device stops working properly during operations, the operator shall safely stop operations. If any of the devices listed in this section are not in proper working order, the equipment shall be taken out of service and operations shall not resume until the device is again working properly. See §§5008 and 5008.1 (Operation). Alternative measures are not permitted to be used.	
§ 1926.1416 Operational aids.	§5016. Operational Aids.	
(a) The devices listed in this section (‘‘listed operational aids’’) are required on all equipment covered by this subpart, unless otherwise specified. (1) The requirements in paragraphs (e)(1), (e)(2), and (e)(3) of this section do not apply to articulating cranes. (2) The requirements in paragraphs (d)(3), (e)(1), and (e)(4) of this section apply only to those digger derricks manufactured after November 8, 2011.	(a) The devices listed in this section (‘‘listed operational aids’’) are required on all equipment covered by Group 13, unless otherwise specified. NOTE: See Section 4968.1 for tower cranes. (1) The requirements in subsections (e)(1), (e)(2), and (e)(3) do not apply to articulating cranes. (2) The requirements in subsections (d)(3), (e)(1), and (e)(4) apply only to those digger derricks manufactured after [Effective date plus one year].	
(b) Operations must not begin unless the listed operational aids are in proper working order, except where an operational aid is being repaired the employer uses the specified temporary alternative measures. The time periods permitted for repairing defective operational aids are specified in paragraphs (d) and (e) of this section. More protective alternative measures specified by the crane/derrick manufacturer, if any, must be followed.	(b) Operations shall not begin unless the listed operational aids are in proper working order, except where an operational aid is being repaired the employer uses the specified temporary alternative measures. The time periods permitted for repairing defective operational aids are specified in subsections (d) and (e). More protective alternative measures specified by the crane/derrick manufacturer, if any, shall be followed.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(c) If a listed operational aid stops working properly during operations, the operator must safely stop operations until the temporary alternative measures are implemented or the device is again working properly. If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under § 1926.1434.	(c) If a listed operational aid stops working properly during operations, the operator shall safely stop operations until the temporary alternative measures are implemented or the device is again working properly.	Other (non-specified) alternatives may require a variance.
(d) Category I operational aids and alternative measures. Operational aids listed in this paragraph that are not working properly must be repaired no later than 7 calendar days after the deficiency occurs. Exception: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, the repair must be completed within 7 calendar days of receipt of the parts. See § 1926.1417(j) for additional requirements.	(d) Category I operational aids. Operational aids listed in this section that are not working properly shall be repaired no later than 7 calendar days after the deficiency occurs. Exception: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, the repair shall be completed within 7 calendar days of receipt of the parts. See §5008.1(i) for additional requirements.	
(1) Boom hoist limiting device. (i) For equipment manufactured after December 16, 1969, a boom hoist limiting device is required. *Temporary alternative measures (use at least one).* One or more of the following methods must be used: (A) Use a boom angle indicator. (B) Clearly mark the boom hoist cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to keep the boom within the minimum allowable radius. In addition, install mirrors or remote video cameras and displays if	(1) Boom hoist limiting device. (A) For equipment manufactured after December 16, 1969, a boom hoist limiting device is required. Temporary alternative measures (use at least one). One or more of the following methods shall be used: 1. Use a boom angle indicator. 2. Clearly mark the boom hoist cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to keep the boom within the minimum allowable radius. In addition, install	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
necessary for the operator to see the mark. (C) Clearly mark the boom hoist cable (so that it can easily be seen by a spotter) at a point that will give the spotter sufficient time to signal the operator and have the operator stop the hoist to keep the boom within the minimum allowable radius.	mirrors or remote video cameras and displays if necessary for the operator to see the mark. 3. Clearly mark the boom hoist cable (so that it can easily be seen by a spotter) at a point that will give the spotter sufficient time to signal the operator and have the operator stop the hoist to keep the boom within the minimum allowable radius.	
(ii) If the equipment was manufactured on or before December 16, 1969, and is not equipped with a boom hoist limiting device, at least one of the measures in paragraphs (d)(1)(i)(A) through (C) of this section must be used.	(B) If the equipment was manufactured on or before December 16, 1969, and is not equipped with a boom hoist limiting device, at least one of the following measures shall be used: 1. Use a boom angle indicator. 2. Clearly mark the boom hoist cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to keep the boom within the minimum allowable radius. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark. 3. Clearly mark the boom hoist cable (so that it can easily be seen by a spotter) at a point that will give the spotter sufficient time to signal the operator and have the operator stop the hoist to keep the boom within the minimum allowable radius.	
(2) Luffing jib limiting device. Equipment with a luffing jib must have a luffing jib limiting device. Temporary alternative measures are the same as in paragraph (d)(1)(i) of this section, except to limit the movement of the luffing jib rather than the boom hoist.	(2) Luffing jib limiting device. Equipment with a luffing jib shall have a luffing jib limiting device. Temporary alternative measures are the same as in subsection (d)(1)(A) of this section, except to limit the movement of the luffing jib rather than the boom hoist.	California does not permit these temporary alternative measures.
(3) Anti two-blocking device.	(3) Anti two-blocking device.	*[See 4924(d)(1)]*

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(i) Telescopic boom cranes manufactured after February 28, 1992, must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur.	(A) Telescopic boom cranes manufactured after February 28, 1992, shall be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) shall prevent such damage at all points where two-blocking could occur.	
Temporary alternative measures: Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a spotter when extending the boom.		California does not permit this temporary alternative measure. *(4924d)*
(ii) Lattice boom cranes. (A) Lattice boom cranes manufactured after Feb 28, 1992, must be equipped with a device that either automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component), or warns the operator in time for the operator to prevent two-blocking. The device must prevent such damage/failure or provide adequate warning for all points where two-blocking could occur. (B) Lattice boom cranes and derricks manufactured after November 8, 2011 must be equipped with a device which automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage/failure at	(B) Lattice boom cranes. 1. Lattice boom cranes manufactured after Feb 28, 1992, shall be equipped with a device that either automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component), or warns the operator in time for the operator to prevent two-blocking. The device shall prevent such damage/failure or provide adequate warning for all points where two-blocking could occur. 2. Lattice boom cranes and derricks manufactured after [Effective date plus one year] shall be equipped with a device which automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) shall prevent such damage/failure at	*See 4924d2*

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
all points where two-blocking could occur.	all points where two-blocking could occur.	
(C) *Exception.* The requirements in paragraphs (d)(3)(ii)(A) and (B) of this section do not apply to such lattice boom equipment when used for dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, marine operations that do not involve hoisting personnel, and pile driving work.	EXCEPTION. The requirements in subsection` (d)(3)(B) do not apply to such lattice boom equipment when used for dragline, clamshell (grapple), magnet, and drop ball work.	The CA exception is more limited than the federal exception. *(4924d2 Ex)*
(D) *Temporary alternative measures.* Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter.		California does not permit this temporary alternative measure.
(iii) Articulating cranes manufactured after December 31, 1999, that are equipped with a load hoist must be equipped with a device that automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device must prevent such damage at all points where two-blocking could occur.	(C) Articulating cranes manufactured after December 31, 1999, that are equipped with a load hoisting device (winch) shall be equipped with a device that automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device shall prevent such damage at all points where two-blocking could occur.	Ed note: Amended with verbiage from 4924(d)(3). Feds effective date is earlier than state.
Temporary alternative measures: When two-blocking could only occur with movement of the load hoist, clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter. When two-blocking could occur without movement of the load hoist, clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to		California does not permit this temporary alternative measure.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
prevent two-blocking, and use a spotter when extending the boom.		
(e) Category II operational aids and alternative measures. Operational aids listed in this paragraph that are not working properly must be repaired no later than 30 calendar days after the deficiency occurs. *Exception:* If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 calendar days, the repair must be completed within 7 calendar days of receipt of the parts. See § 1926.1417(j) for additional requirements.	(e) Category II operational aids and alternative measures. Operational aids listed in this subsection that are not working properly shall be repaired no later than 30 calendar days after the deficiency occurs. EXCEPTION: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 calendar days, the repair shall be completed within 7 calendar days of receipt of the parts. See §5008.1(i) for additional requirements.	
(1) Boom angle or radius indicator. The equipment must have a boom angle or radius indicator readable from the operator's station. *Temporary alternative measures:* Radii or boom angle must be determined by measuring the radii or boom angle with a measuring device.	(1) Cranes shall be provided with a boom angle or radius indicator which clearly shows the boom angle in degrees to the operator at all times. EXCEPTION: When a boom angle or radius indicator is inoperative or malfunctioning, a qualified person shall determine the radius or boom angle by measurement until the indicator is restored to operation. (A) Boom angle or radius indicators shall be repaired in accordance with the manufacturer's recommendations.	Relocated from 4924(c) except amended to apply to all cranes; not just mobile.
(2) Jib angle indicator if the equipment has a luffing jib. *Temporary alternative measures:* Radii or jib angle must be determined by ascertaining the main boom angle and then measuring the radii or jib angle with a measuring device.	(2) Jib angle indicator if the equipment has a luffing jib. Temporary alternative measures: Radii or jib angle shall be determined by a qualified person ascertaining the main boom angle and then measuring the radii or jib angle with a measuring device.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	(A) Jib angle or radius indicators shall be repaired in accordance with the manufacturer's recommendations.	
(3) Boom length indicator if the equipment has a telescopic boom, except where the rated capacity is independent of the boom length. *Temporary alternative measures.* One or more of the following methods must be used: (i) Mark the boom with measured marks to calculate boom length, (ii) Calculate boom length from boom angle and radius measurements, (iii) Measure the boom with a measuring device.	(3) Boom length indicator if the equipment has a telescopic boom, except where the rated capacity is independent of the boom length. Temporary alternative measures. One or more of the following methods shall be used: (A) Mark the boom with measured marks to calculate boom length, (B) Calculate boom length from boom angle and radius measurements, (C) Measure the boom with a measuring device.	[Ed note: Related to 4954(b), but does not conflict.]
(4) Load weighing and similar devices. (i) Equipment (other than derricks and articulating cranes) manufactured after March 29, 2003 with a rated capacity over 6,000 pounds must have at least one of the following: load weighing device, load moment (or rated capacity) indicator, or load moment (or rated capacity) limiter.	(4) Load weighing and similar devices. (A) Equipment (other than derricks and articulating cranes) manufactured after March 29, 2003 with a rated capacity over 6,000 pounds shall have at least one of the following: load weighing device, load moment (or rated capacity) indicator, or load moment (or rated capacity) limiter.	Replaces 4924(b).
Temporary alternative measures: The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer) or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight). This information must be provided to the operator prior to the lift.	EXCEPTION: When installed load indicating devices are not functional, a qualified person shall determine load weights until the device is restored to operation. When installed load indicating devices are not functional, a qualified person shall determine load weights until the device is restored to operation. (A) Load indicating devices shall be repaired in accordance with the manufacturer's recommendations.	Relocated verbiage taken from exception to 4924(b)
(ii) Articulating cranes manufactured after November 8, 2011 must have at least one of the	(B) Articulating cranes manufactured after [Effective date plus one year] shall have at least	

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FEDERAL: §1926	STATE:	RATIONALE
following: automatic overload prevention device, load weighing device, load moment (or rated capacity) indicator, or load moment (rated capacity) limiter.	one of the following: automatic overload prevention device, load weighing device, load moment (or rated capacity) indicator, or load moment (rated capacity) limiter.	
Temporary alternative measures: The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer) or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight). This information must be provided to the operator prior to the lift.	Temporary alternative measures: The weight of the load shall be determined from a source recognized by the industry (such as the load's manufacturer) or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight). This information shall be provided to the operator prior to the lift.	
(5) The following devices are required on equipment manufactured after November 8, 2011: (i) Outrigger/stabilizer position (horizontal beam extension) sensor/monitor if the equipment has outriggers or stabilizers. *Temporary alternative measures:* The operator must verify that the position of the outriggers or stabilizers is correct (in accordance with manufacturer procedures) before beginning operations requiring outrigger or stabilizer deployment.	(5) The following devices are required on equipment manufactured after [Effective date plus one year]: (A) Outrigger/stabilizer position (horizontal beam extension) sensor/monitor if the equipment has outriggers or stabilizers. Temporary alternative measures: The operator shall verify that the position of the outriggers or stabilizers is correct (in accordance with manufacturer procedures) before beginning operations requiring outrigger or stabilizer deployment.	
(ii) Hoist drum rotation indicator if the equipment has a hoist drum not visible from the operator's station. *Temporary alternative measures:* Mark the drum to indicate the rotation of the drum. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark.	(B) Hoist drum rotation indicator if the equipment has a hoist drum not visible from the operator's station. Temporary alternative measures: Mark the drum to indicate the rotation of the drum. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
§ 1926.1417 Operation.	§5008.1 Operation.	
(a) The employer must comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments.	(a) The employer shall comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments.	Adopt federal verbiage.
(b) Unavailable operation procedures. (1) Where the manufacturer procedures are unavailable, the employer must develop and ensure compliance with all procedures necessary for the safe operation of the equipment and attachments. (2) Procedures for the operational controls must be developed by a qualified person. (3) Procedures related to the capacity of the equipment must be developed and signed by a registered professional engineer familiar with the equipment.	(d) Unavailable operation procedures. (1) Where the manufacturer procedures are unavailable, the employer shall develop and ensure compliance with all procedures necessary for the safe operation of the equipment and attachments. (2) Procedures for the operational controls shall be developed by a certified agent. (3) Procedures related to the capacity of the equipment shall be developed and signed by a certified agent.	Federal verbiage except that "qualified person" and "registered professional engineer" are replaced with "certified agent," consistent with 4965 and definitions in section 4885.
(c) Accessibility of procedures. (1) The procedures applicable to the operation of the equipment, including rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions, and operator's manual, must be readily available in the cab at all times for use by the operator.	(b) Each crane shall be provided with a descriptive booklet, written in English, containing a comprehensive summary of design characteristics, erection procedures, operation techniques, repair recommendations, and safety precautions. This booklet shall be available on every job site where such cranes are in use. (c) A durable, clearly legible load rating chart shall be provided with each crane and securely affixed in the cab or operator's station easily visible to the operator while at the controls. The chart shall include load ratings and restrictions as specified by the certified agent for specific lengths of components, counterweights, swing, and radii. Where load ratings for cranes are governed by structural competence, the limitation on loading shall be such that no	Relocated from section 4965(b) and (c) which covers this subject. These subsections are being relocated to section 5008.1 for general applicability.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	structural member is overstressed, and load rating charts shall be subject to this limitation.	
(2) Where rated capacities are available in the cab only in electronic form: In the event of a failure which makes the rated capacities inaccessible, the operator must immediately cease operations or follow safe shut-down procedures until the rated capacities (in electronic or other form) are available.	(1) Where rated capacities are available in the cab only in electronic form: In the event of a failure which makes the rated capacities inaccessible, the operator shall immediately cease operations or follow safe shut-down procedures until the rated capacities (in electronic or other form) are available.	Adopt federal verbiage.
(d) The operator must not engage in any practice or activity that diverts his/her attention while actually engaged in operating the equipment, such as the use of cellular phones (other than when used for signal communications).	(e) The operator shall not engage in any practice or activity that diverts his/her attention while actually engaged in operating the equipment, such as the use of cellular phones (other than when used for signal communications).	Adopt federal verbiage.
(e) Leaving the equipment unattended. (1) The operator must not leave the controls while the load is suspended, except where all of the following are met: (i) The operator remains adjacent to the equipment and is not engaged in any other duties. (ii) The load is to be held suspended for a period of time exceeding normal lifting operations. (iii) The competent person determines that it is safe to do so and implements measures necessary to restrain the boom hoist and telescoping, load, swing, and outrigger or stabilizer functions. (iv) Barricades or caution lines, and notices, are erected to prevent all employees from entering the fall zone. No employees, including those listed in §§	5008 Operating Practices. *** (e) Before leaving the crane unattended, the operator shall be required to: (1) Land or properly secure any attached load, bucket, lifting magnet, or other device; (2) Disengage clutch; (3) Set travel, swing, boom brakes, and other locking devices unless otherwise specified by the certified agents; (4) Put controls in the "off" position; (5) Stop the engine or motor; (6) Secure crane against accidental travel. ===== 4999 Handling Loads. *** (i) Holding the Load. (1) When a load of any kind is to be suspended for any considerable time, the drum holding	See 4999(i)

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
1926.1425(b)(1) through (3), § 1926.1425(d) or § 1926.1425(e), are permitted in the fall zone. (2) The provisions in § 1926.1417(e)(1) do not apply to working gear (such as slings, spreader bars, ladders, and welding machines) where the weight of the working gear is negligible relative to the lifting capacity of the equipment as positioned, and the working gear is suspended over an area other than an entrance or exit.	mechanism shall be used in addition to the brake which shall also be applied. (2) Cranes, hoists, or derricks shall not be left unattended while the load is suspended unless the load is suspended over water, a barricaded area, or is blocked up or otherwise supported from below during repairs or emergency.	
(f) Tag-out. (1) Tagging out of service equipment/functions. Where the employer has taken the equipment out of service, a tag must be placed in the cab stating that the equipment is out of service and is not to be used. Where the employer has taken a function(s) out of service, a tag must be placed in a conspicuous position stating that the function is out of service and is not to be used.	5008.1(f) Tag-out. (1) Tagging out of service equipment/functions. Where the employer has taken the equipment out of service, a tag shall be placed in the cab stating that the equipment is out of service and is not to be used. Where the employer has taken a function(s) out of service, a tag shall be placed in a conspicuous position stating that the function is out of service and is not to be used.	
(2) Response to ‘‘do not operate’’/tagout signs. (i) If there is a warning (tag-out or maintenance/do not operate) sign on the equipment or starting control, the operator must not activate the switch or start the equipment until the sign has been removed by a person authorized to remove it, or until the operator has verified that: (A) No one is servicing, working on, or otherwise in a dangerous position on the machine. (B) The equipment has been repaired and is working properly.	(2) Response to ‘‘do not operate’’/tagout signs. (A) If there is a warning (tag-out or maintenance/do not operate) sign on the equipment or starting control, the operator shall not activate the switch or start the equipment until the sign has been removed by a person authorized to remove it in accordance with the provisions of Section 3314.	Modified federal verbiage. CA Lock-out Tag-out standards (Section 3314) are more protective than parts of this federal paragraph.
(ii) If there is a warning (tag-out or maintenance/do not operate) sign on any other switch or control, the operator must not activate	(B) If there is a warning (tag-out or maintenance/do not operate) sign on any other switch or control, the operator shall not activate	Modified federal verbiage. CA Lock-out Tag-out standards (Section 3314) are more protective than parts of this federal paragraph.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
that switch or control until the sign has been removed by a person authorized to remove it, or until the operator has verified that the requirements in paragraphs (f)(2)(i)(A) and (B) of this section have been met.	that switch or control until the sign has been removed by a person authorized to remove it in accordance with the provisions of Section 3314.	
(g) Before starting the engine, the operator must verify that all controls are in the proper starting position and that all personnel are in the clear.	5008(f) Before closing the switch or starting the engine, all controls shall be in the "off" position and all personnel in the clear.	
(h) Storm warning. When a local storm warning has been issued, the competent person must determine whether it is necessary to implement manufacturer recommendations for securing the equipment. (i) [Reserved.]	5008.1(h) Storm warning. When a local storm warning has been issued, the competent person shall determine whether it is necessary to implement manufacturer recommendations for securing the equipment.	
(j) If equipment adjustments or repairs are necessary: (1) The operator must, in writing, promptly inform the person designated by the employer to receive such information and, where there are successive shifts, to the next operator; and (2) The employer must notify all affected employees, at the beginning of each shift, of the necessary adjustments or repairs and all alternative measures.	(i) If equipment adjustments or repairs are necessary: (1) The operator shall, in writing, promptly inform the person designated by the employer to receive such information and, where there are successive shifts, to the next operator; and (2) The employer shall notify all affected employees, at the beginning of each shift, of the necessary adjustments or repairs and all alternative measures.	
(k) Safety devices and operational aids must not be used as a substitute for the exercise of professional judgment by the operator. (l) [Reserved.]	(j) Safety devices and operational aids shall not be used as a substitute for the exercise of professional judgment by the operator.	*[Ed note: this may be unenforceable.]*
(m) If the competent person determines that there is a slack rope condition requiring re-spooling of the rope, it must be verified (before starting to lift) that the rope is seated on the drum and in the sheaves as the slack is	4999(e) Before Starting to Hoist: *** (4) If there is a slack rope condition, the rope shall be properly seated on the drum and in the sheaves.	

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FEDERAL: §1926	STATE:	RATIONALE
removed.		
(n) The competent person must adjust the equipment and/or operations to address the effect of wind, ice, and snow on equipment stability and rated capacity.	5008.1(k) The competent person shall adjust the equipment and/or operations to address the effect of wind, ice, and snow on equipment stability and rated capacity.	*[Ed note: should this be "qualified person," "certified agent," or…?]*
(o) Compliance with rated capacity. (1) The equipment must not be operated in excess of its rated capacity. (2) The operator must not be required to operate the equipment in a manner that would violate paragraph (o)(1) of this section.	(*l*) Compliance with rated capacity. (1) The equipment shall not be operated in excess of its rated capacity. (2) The operator shall not be required to operate the equipment in a manner that would violate subsection (*l*)(1).	*[Ed note: (n)(2) seems redundant.]*
(3) Load weight. The operator must verify that the load is within the rated capacity of the equipment by at least one of the following methods: (i) The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. In addition, when requested by the operator, this information must be provided to the operator prior to the lift; or (ii) The operator must begin hoisting the load to determine, using a load weighing device, load moment indicator, rated capacity indicator, or rated capacity limiter, if it exceeds 75 percent of the maximum rated capacity at the longest radius that will be used during the lift operation. If it does, the operator must not proceed with the lift until he/she verifies the weight of the load in accordance with paragraph (o)(3)(i) of this section.	4999 Handling Loads. (b) Size of Load. A crane, derrick, or hoist shall not be loaded beyond the rated capacity or safe working load whichever is smaller, except for test purposes. In all operations where the weight of the load being handled is unknown and may approach the rated capacity, there shall be a qualified person (rigger) assigned to determine the magnitude of the load, unless the crane or derrick is equipped with a load weighing device. The operator shall not make any lift under these conditions until informed of such weight by the qualified person (rigger) assigned to that operation.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(p) The boom or other parts of the equipment must not contact any obstruction.	4999(f)(2) During Hoisting: … (2) ~~Inadvertent contact with obstructions shall be prevented.~~ The boom or other parts of the equipment shall not contact any obstruction.	
(q) The equipment must not be used to drag or pull loads sideways.	4999(g) Side Loading. Side loading of booms shall be limited to freely suspended loads, and booms shall not be used for dragging loads sideways unless the boom is specifically designed and constructed to withstand such side loading.	
(r) On wheel-mounted equipment, no loads must be lifted over the front area, except as permitted by the manufacturer.	4999(k) On ~~truck~~ wheel-mounted cranes, no loads shall be lifted over the front area except as permitted by the manufacturer. ~~approved by the certified agency.~~	
(s) The operator must test the brakes each time a load that is 90% or more of the maximum line pull is handled by lifting the load a few inches and applying the brakes. In duty cycle and repetitive lifts where each lift is 90% or more of the maximum line pull, this requirement applies to the first lift but not to successive lifts.	4994 Hoisting (c) The brakes shall be tested each time a load approaching the rated load is handled by raising the load a few inches and applying the brakes.	
(t) Neither the load nor the boom must be lowered below the point where less than two full wraps of rope remain on their respective drums.	4994(d) The load or the boom shall not be lowered below the point where less than two full wraps of rope remain on grooved drums and three full wraps on ungrooved drums.	
(u) Traveling with a load. (1) Traveling with a load is prohibited if the practice is prohibited by the manufacturer. (2) Where traveling with a load, the employer must ensure that: (i) A competent person supervises the operation, determines if it is necessary to reduce rated capacity, and makes	§4991. Travel. (a) The travel of cranes or boom-type excavators shall be controlled so as to avoid collision with persons, material, and equipment. The cabs of units (of the revolving type) traveling under their own power shall be turned so as to provide the least obstruction to the operator's vision in the direction of travel,	Federal verbiage added as subsections (c) and (d) [below]. Ed note: Use “competent person” or “certified agent” or… in (d)(1)?

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
determinations regarding load position, boom location, ground support, travel route, overhead obstructions, and speed of movement necessary to ensure safety. (ii) The determinations of the competent person required in paragraph (u)(2)(i) of this section are implemented. (iii) For equipment with tires, tire pressure specified by the manufacturer is maintained.	unless receiving signals from someone with an unobstructed view. (b) In transit, the following additional precautions for mobile cranes shall be exercised: (1) The boom shall be carried in line with the direction of motion and the superstructure shall be secured against rotation, except when negotiating turns when there is an operator in the cab, or when the boom is supported on a dolly. (2) The empty hook, headache ball, or block shall be lashed or otherwise restrained so that it cannot swing freely.	
(u) Traveling with a load. (1) Traveling with a load is prohibited if the practice is prohibited by the manufacturer. (2) Where traveling with a load, the employer must ensure that: (i) A competent person supervises the operation, determines if it is necessary to reduce rated capacity, and makes determinations regarding load position, boom location, ground support, travel route, overhead obstructions, and speed of movement necessary to ensure safety. (ii) The determinations of the competent person required in paragraph (u)(2)(i) of this section are implemented. (iii) For equipment with tires, tire pressure specified by the manufacturer is maintained.	(c) Traveling with a load is prohibited if the practice is prohibited by the manufacturer. (d) Where traveling with a load, the employer shall ensure that: (1) A competent person supervises the operation, determines if it is necessary to reduce rated capacity, and makes determinations regarding load position, boom location, ground support, travel route, overhead obstructions, and speed of movement necessary to ensure safety. (2) For equipment with tires, tire pressure specified by the manufacturer is maintained.	Federal (u)(2)(ii) is redundant.
(v) Rotational speed of the equipment must be	§4993. Swing. (a) When rotating the crane, sudden stops shall be avoided. Rotational speed shall be such that	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
such that the load does not swing out beyond the radius at which it can be controlled.	the load does not swing out beyond the radius at which it can be safely controlled.	
(w) A tag or restraint line must be used if necessary to prevent rotation of the load that would be hazardous.	§4993(b) Tag or restraint lines shall be used where rotation of the load is hazardous.	
(x) The brakes must be adjusted in accordance with manufacturer procedures to prevent unintended movement.	§5034. Adjustments and Repairs. *** (d) Adjustments shall be maintained to assure correct functioning of the following components: (1) All functional operating mechanisms. (2) Safety devices. (3) Control systems. (4) Power plants. (5) Brakes.	
(y) The operator must obey a stop (or emergency stop) signal, irrespective of who gives it.	§5001. Signals. (b) Only qualified persons shall be permitted to give signals. EXCEPTION: An emergency stop signal may be given by any person. === §5008. Operating Practices. (b) The operator shall respond to signals only from the appointed signal person, but shall obey an emergency stop signal from any person.	Amended to be ALAEA
(z) Swinging locomotive cranes. A locomotive crane must not be swung into a position where railway cars on an adjacent track could strike it, until it is determined that cars are not being moved on the adjacent track and that proper flag protection has been established.	§4993. Swing. (d) A locomotive crane shall not be swung into a position where railway cars on an adjacent track might strike it, until it has been ascertained that cars are not being moved on the adjacent track and proper flag protection has been established.	
	§5008.1. Operation.	These provisions also apply to tower cranes, so

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(aa) Counterweight/ballast. (1) The following applies to equipment other than tower cranes: (i) Equipment must not be operated without the counterweight or ballast in place as specified by the manufacturer. (ii) The maximum counterweight or ballast specified by the manufacturer for the equipment must not be exceeded.	(m) Counterweight/ballast. (1) Equipment shall not be operated without the counterweight or ballast in place as specified by the manufacturer. (2) The maximum counterweight or ballast specified by the manufacturer for the equipment shall not be exceeded.	subparagraph (aa)(1) is unnecessary. However there are additional requirements for tower cranes, and those will be found in the section on tower cranes.
(2) Counterweight/ballast requirements for tower cranes are specified in § 1926.1435(b)(8).		Cross-reference is unnecessary.
§ 1926.1418 Authority to stop operation.	§5008. Operating Practices.	
Whenever there is a concern as to safety, the operator must have the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.	(c) Whenever the operator doubts the safety of a movement, the operator shall have the authority ~~be authorized~~ to stop the hoisting operation until a qualified person has determined that safety has been assured.	
§ 1926.1419 Signals—general requirements.	§5001. Signals – General requirements.	
(a) A signal person must be provided in each of the following situations: (1) The point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator. (2) When the equipment is traveling, the view in the direction of travel is obstructed. (3) Due to site specific safety concerns, either the operator or the person handling the load determines that it is necessary.	(a) A signal person shall be provided in each of the following situations: ~~when the point of operation is not in full and direct view of the operator unless a signaling or control device is provided for safe direction of the operator.~~ (1) The point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator. (2) When the equipment is traveling, the view in the direction of travel is obstructed. (3) Due to site-specific safety concerns, either the operator or the person handling the load determines that it is necessary.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	(b) Only qualified persons shall be permitted to give signals. EXCEPTION: An emergency stop signal may be given by any person.	
(b) Types of signals. Signals to operators must be by hand, voice, audible, or new signals.	(c) Types of signals. Signals to operators shall be by hand, voice, audible, or new signals.	
(c) Hand signals. (1) When using hand signals, the Standard Method must be used (see Appendix A of this subpart).	(d) Hand Signals. ~~(c)~~ A uniform signal system shall be used on all operations. ~~and~~ (1) I~~i~~f hand signals are used, they shall be clearly understood by the operator. (Note: See recommended hand signals, ~~see~~ Plate I.)	
Exception: Where use of the Standard Method for hand signals is infeasible, or where an operation or use of an attachment is not covered in the Standard Method, nonstandard hand signals may be used in accordance with paragraph (c)(2) of this section.	EXCEPTION: Where an operation or use of an attachment is not covered in the Standard Method, nonstandard hand signals may be used in accordance with subsection (d)(2).	
(2) Non-standard hand signals. When using non-standard hand signals, the signal person, operator, and lift director (where there is one) must contact each other prior to the operation and agree on the non-standard hand signals that will be used.	(2) Non-standard hand signals. When using non-standard hand signals, the signal person, operator, and lift director (where there is one) shall contact each other prior to the operation and agree on the non-standard hand signals that will be used.	
	(3) ~~(e)~~ There shall be conspicuously posted in the vicinity of the hoisting operations, a legible chart depicting and explaining the system of signals used.	
(d) New signals. Signals other than hand, voice, or audible signals may be used where the employer demonstrates that: (1) The new signals provide at least equally effective communication as voice, audible, or Standard Method hand signals, or	(e) New signals. Signals other than hand, voice, or audible signals may be used where the employer demonstrates that: (1) The new signals provide at least equally effective communication as voice, audible, or Standard Method hand signals, or	Note to Crane Unit: are these alternatives OK?

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(2) The new signals comply with a national consensus standard that provides at least equally effective communication as voice, audible, or Standard Method hand signals.	(2) The new signals comply with a national consensus standard that provides at least equally effective communication as voice, audible, or Standard Method hand signals.	
(e) Suitability. The signals used (hand, voice, audible, or new), and means of transmitting the signals to the operator (such as direct line of sight, video, radio, etc.), must be appropriate for the site conditions.	(f) Suitability. The signals used (hand, voice, audible, or new), and means of transmitting the signals to the operator (such as direct line of sight, video, radio, etc.), shall be appropriate for the site conditions.	
(f) During operations requiring signals, the ability to transmit signals between the operator and signal person must be maintained. If that ability is interrupted at any time, the operator must safely stop operations requiring signals until it is reestablished and a proper signal is given and understood.	(g) During operations requiring signals, the ability to transmit signals between the operator and signal person shall be maintained. If that ability is interrupted at any time, the operator shall safely stop operations requiring signals until it is reestablished and a proper signal is given and understood. (1) ~~(d)~~ Signal systems other than manual shall be protected against unauthorized use, breakage, weather or obstruction which will interfere with safe operation. In the event of any known malfunction, an alternate signal system shall be used or all motion shall be stopped.	
(g) If the operator becomes aware of a safety problem and needs to communicate with the signal person, the operator must safely stop operations. Operations must not resume until the operator and signal person agree that the problem has been resolved.	(h) If the operator becomes aware of a safety problem and needs to communicate with the signal person, the operator shall safely stop operations. Operations shall not resume until the operator and signal person agree that the problem has been resolved.	
(h) Only one person may give signals to a crane/derrick at a time, except in circumstances covered by paragraph (j) of this section. (i) [Reserved.] (j) Anyone who becomes aware of a safety	5008(b) The operator shall respond to signals only from the appointed signal person, but shall obey an emergency stop signal at any time.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
problem must alert the operator or signal person by giving the stop or emergency stop signal. (Note: § 1926.1417(y) requires the operator to obey a stop or emergency stop signal).		
(k) All directions given to the operator by the signal person must be given from the operator's direction perspective. (l) [Reserved.]	(i) All directions given to the operator by the signal person shall be given from the operator's direction perspective.	
(m) Communication with multiple cranes/ derricks. Where a signal person(s) is in communication with more than one crane/derrick, a system must be used for identifying the crane/derrick each signal is for, as follows: (1) for each signal, prior to giving the function/direction, the signal person must identify the crane/derrick the signal is for, or (2) must use an equally effective method of identifying which crane/derrick the signal is for.	(j) Communication with multiple cranes/ derricks. Where a signal person(s) is in communication with more than one crane/derrick, a system shall be used for identifying the crane/derrick each signal is for, as follows: (1) for each signal, prior to giving the function/direction, the signal person shall identify the crane/derrick the signal is for, or (2) shall use an equally effective method of identifying which crane/derrick the signal is for.	
§ 1926.1420 Signals—radio, telephone or other electronic transmission of signals.	§5001.1. Signals – Radio, Telephone or other Electronic Transmission Of Signals.	
(a) The device(s) used to transmit signals must be tested on site before beginning operations to ensure that the signal transmission is effective, clear, and reliable.	(a) The device(s) used to transmit signals shall be tested on site before beginning operations to ensure that the signal transmission is effective, clear, and reliable.	
(b) Signal transmission must be through a dedicated channel, except: (1) Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations. (2) Where a crane is being operated on or adjacent to railroad tracks, and the actions of	(b) Signal transmission must be through a dedicated channel, except: (1) Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations. (2) Where a crane is being operated on or adjacent to railroad tracks, and the actions of	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
the crane operator need to be coordinated with the movement of other equipment or trains on the same or adjacent tracks.	the crane operator need to be coordinated with the movement of other equipment or trains on the same or adjacent tracks.	
(c) The operator's reception of signals must be by a hands-free system.	(c) The operator's reception of signals shall be by a hands-free system.	
§ 1926.1421 Signals—voice signals—additional requirements.	§5001.2. Signals – Voice Signals – Additional Requirements.	
(a) Prior to beginning operations, the operator, signal person and lift director (if there is one), must contact each other and agree on the voice signals that will be used. Once the voice signals are agreed upon, these workers need not meet again to discuss voice signals unless another worker is added or substituted, there is confusion about the voice signals, or a voice signal is to be changed.	(a) Prior to beginning operations, the operator, signal person and lift director (if there is one), shall contact each other and agree on the voice signals that will be used. Once the voice signals are agreed upon, these workers need not meet again to discuss voice signals unless another worker is added or substituted, there is confusion about the voice signals, or a voice signal is to be changed.	
(b) Each voice signal must contain the following three elements, given in the following order: function (such as hoist, boom, etc.), direction; distance and/or speed; function, stop command.	(b) Each voice signal shall contain the following three elements, given in the following order: function (such as hoist, boom, etc.), direction; distance and/or speed; function, stop command.	
(c) The operator, signal person and lift director (if there is one), must be able to effectively communicate in the language used.	(c) The operator, signal person and lift director (if there is one), shall be able to effectively communicate in the language used.	
§ 1926.1422 Signals—hand signal chart.	§5001. Signals – General requirements.	
Hand signal charts must be either posted on the equipment or conspicuously posted in the vicinity of the hoisting operations.	*** (d)(3) ~~(e)~~ There shall be conspicuously posted in the vicinity of the hoisting operations, a legible chart depicting and explaining the system of signals used.	
§ 1926.1423 Fall protection.	§5010. Fall Protection.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(a) Application. (1) Paragraphs (b), (c)(3), (e) and (f) of this section apply to all equipment covered by this subpart except tower cranes. (2) Paragraphs (c)(1), (c)(2), (d), (g), (j) and (k) of this section apply to all equipment covered by this subpart. (3) Paragraphs (c)(4) and (h) of this section apply only to tower cranes.	(a) Application. (1) Subsections (b), (c)(3), (e) and (f) of this section apply to all equipment covered by GISO Group 13 except tower cranes. (2) Subsections (c)(1), (c)(2), (d), and (g) of this section apply to all equipment covered by GISO Group 13. (3) Subsections (c)(4) and (h) of this section apply only to tower cranes.	
(b) Boom walkways. (1) Equipment manufactured after November 8, 2011 with lattice booms must be equipped with walkways on the boom(s) if the vertical profile of the boom (from cord centerline to cord centerline) is 6 or more feet. (2) Boom walkway criteria. (i) The walkways must be at least 12 inches wide. (ii) Guardrails, railings and other permanent fall protection attachments along walkways are: (A) Not required. (B) Prohibited on booms supported by pendant ropes or bars if the guardrails/ railings/ attachments could be snagged by the ropes or bars. (C) Prohibited if of the removable type (designed to be installed and removed each time the boom is assembled/disassembled). (D) Where not prohibited, guardrails or railings may be of any height up to, but not more than, 45 inches.	(b) Boom walkways. (1) Equipment manufactured after [Effective date plus 1 year] with lattice booms shall be equipped with walkways on the boom(s) if the vertical profile of the boom (from cord centerline to cord centerline) is 6 or more feet. (2) Boom walkway criteria. (A) The walkways shall be at least 12 inches wide. (B) Guardrails, railings and other permanent fall protection attachments along boom walkways are: 1. Not required. 2. Prohibited on booms supported by pendant ropes or bars if the guardrails/ railings/ attachments could be snagged by the ropes or bars. 3. Prohibited if of the removable type (designed to be installed and removed each time the boom is assembled/disassembled). 4. Where not prohibited, guardrails or railings shall be in accordance with Sections 3209 and 3210.	
(c) Steps, handholds, ladders, grabrails, guardrails and railings.	(c) Steps, handholds, ladders, grabrails, guardrails and railings.	Note to Crane Unit: Do we want the "except where infeasible"?

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(1) Section 1926.502(b) does not apply to equipment covered by this subpart. (2) The employer must maintain in good condition originally-equipped steps, handholds, ladders and guardrails/railings/grabrails. (3) Equipment manufactured after November 8, 2011 must be equipped so as to provide safe access and egress between the ground and the operator work station(s), including the forward and rear positions, by the provision of devices such as steps, handholds, ladders, and guardrails/railings/grabrails. These devices must meet the following criteria: (i) Steps, handholds, ladders and guardrails/ railings/grabrails must meet the criteria of SAE J185 (May 2003) (incorporated by reference, see § 1926.6) or ISO 11660–2:1994(E) (incorporated by reference, see § 1926.6) except where infeasible. (ii) Walking/stepping surfaces, except for crawler treads, must have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint). (4) Tower cranes manufactured after November 8, 2011 must be equipped so as to provide safe access and egress between the ground and the cab, machinery platforms, and tower (mast), by the provision of devices such as steps, handholds, ladders, and guardrails/railings/ grabrails. These devices must meet the following criteria: (i) Steps, handholds, ladders, and guardrails/	(1) Construction Safety Orders, Article 16 (Railings) does not apply to equipment covered by General Industry Safety Orders, Group 13. (2) The employer shall maintain in good condition originally-equipped steps, handholds, ladders and guardrails/railings/grabrails. (3) Equipment manufactured after [Effective date plus 1 year] shall be equipped so as to provide safe access and egress between the ground and the operator work station(s), including the forward and rear positions, by the provision of devices such as steps, handholds, ladders, and guardrails/railings/grabrails. These devices shall meet the following criteria: (A) Steps, handholds, ladders and guardrails/ railings/grabrails shall meet the criteria of SAE J185 (May 2003) (incorporated by reference) or ISO 11660–2:1994(E) (incorporated by reference) except where infeasible. (B) Walking/stepping surfaces, except for crawler treads, shall have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint). (4) Tower cranes manufactured after [Effective date plus 1 year] shall be equipped so as to provide safe access and egress between the ground and the cab, machinery platforms, and tower (mast), by the provision of devices such as steps, handholds, ladders, and guardrails/railings/ grabrails. These devices shall meet the following criteria: (A) Steps, handholds, ladders, and guardrails/ railings/grabrails shall meet the criteria of ISO	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
railings/grabrails must meet the criteria of ISO 11660–1:2008(E) (incorporated by reference, see § 1926.6) and ISO 11660–3:2008(E) (incorporated by reference, see § 1926.6) or SAE J185 (May 2003) (incorporated by reference, see § 1926.6) except where infeasible. (ii) Walking/stepping surfaces must have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).	11660–1:2008(E) (incorporated by reference) and ISO 11660–3:2008(E) (incorporated by reference) or SAE J185 (May 2003) (incorporated by reference) except where infeasible. (B) Walking/stepping surfaces shall have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).	
(d) Personal fall arrest and fall restraint systems. Personal fall arrest system components must be used in personal fall arrest and fall restraint systems and must conform to the criteria in § 1926.502(d) except that § 1926.502(d)(15) does not apply to components used in personal fall arrest and fall restraint systems. Either body belts or body harnesses must be used in personal fall arrest and fall restraint systems.	(d) Personal fall arrest and fall restraint systems. Personal fall arrest system components shall be used in personal fall arrest and fall restraint systems and shall conform to the criteria in §1670 except that §1670(b)(10) does not apply to components used in personal fall arrest and fall restraint systems.	Section 1670 spells out where body belts and harnesses may be used. Body belts are not permitted for use in fall arrest systems.
(e) For non-assembly/disassembly work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level as follows: (1) When moving point-to-point: (i) On non-lattice booms (whether horizontal or not horizontal). (ii) On lattice booms that are not horizontal. (iii) On horizontal lattice booms where the fall distance is 15 feet or more. (2) While at a work station on any part of the	(e) For non-assembly/disassembly work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 7-1/2 feet above a lower level as follows: (1) When moving point-to-point: (A) On non-lattice booms (whether horizontal or not horizontal). (B) On lattice booms that are not horizontal. EXCEPTION: On horizontal lattice booms where the fall distance is less than 15 feet. (2) While at a work station on any part of the	Ed comment: (e)(1)(iii) was changed to an exception as it is confusing in the federal verbiage (is the trigger height 6’ or 15’ for horizontal lattice booms?)

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
equipment (including the boom, of any type), except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.	equipment (including the boom, of any type), except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.	
(f) For assembly/disassembly work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.	(f) For assembly/disassembly work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.	
(g) Anchorage criteria. (1) Sections 1926.502(d)(15) and 1926.502(e)(2) apply to equipment covered by this subpart only to the extent delineated in paragraph (g)(2) of this section. (2) Anchorages for personal fall arrest and positioning device systems. (i) Personal fall arrest systems must be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in § 1926.502(d)(15) would not be met. (ii) Positioning device systems must be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in § 1926.502(e)(2) would not be met. (iii) Attachable anchor devices (portable anchor devices that are attached to the equipment) must meet the anchorage criteria in §	(g) Anchorage criteria. (1) Sections §1670(b)(10) and 1670(c)(4) apply to equipment covered by this section only to the extent delineated in subsection (g)(2) of this section. (2) Anchorages for personal fall arrest and positioning device systems. (A) Personal fall arrest systems shall be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, would conclude that the criteria in § 1670(b)(10) would not be met. (B) Positioning device systems shall be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, would conclude that the criteria in §1670(c)(4) would not be met. (C) Attachable anchor devices (portable anchor devices that are attached to the equipment) shall meet the anchorage criteria in §1670(b)(10) for	Ed comment: I believe the "without an engineering analysis" makes these provisions less protective than CA (which is silent on the analysis).

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
1926.502(d)(15) for personal fall arrest systems and § 1926.502(e)(2) for positioning device systems. (3) Anchorages for fall restraint systems. Fall restraint systems must be anchored to any part of the equipment that is capable of withstanding twice the maximum load that an employee may impose on it during reasonably anticipated conditions of use.	personal fall arrest systems and §1670(c)(4) for positioning device systems. (3) Anchorages for fall restraint systems. Fall restraint systems shall be anchored to any part of the equipment that is capable of withstanding twice the maximum load that an employee may impose on it during reasonably anticipated conditions of use.	
(h) Tower cranes. (1) For work other than erecting, climbing, and dismantling, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck. (2) For erecting, climbing, and dismantling work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level. (i) [Reserved.]	(h) Tower cranes. (1) For work other than erecting, climbing, and dismantling, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 7-1/2 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck. (2) For erecting, climbing, and dismantling work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level.	
(j) Anchoring to the load line. A personal fall arrest system is permitted to be anchored to the crane/derrick's hook (or other part of the load line) where all of the following requirements are met: (1) A qualified person has determined that the set-up and rated capacity of the crane/derrick (including the hook, load line and rigging)		This practice is not allowed in CA.

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
meets or exceeds the requirements in § 1926.502(d)(15). (2) The equipment operator must be at the work site and informed that the equipment is being used for this purpose. (3) No load is suspended from the load line when the personal fall arrest system is anchored to the crane/derrick's hook (or other part of the load line).		
(k) Training. The employer must train each employee who may be exposed to fall hazards while on, or hoisted by, equipment covered by this subpart on all of the following: (1) the requirements in this subpart that address fall protection. (2) the applicable requirements in §§ 1926.500 and 1926.502.		This is covered by Section 3203(a)(7).
§ 1926.1424 Work area control.		
(a) Swing radius hazards. (1) The requirements in paragraph (a)(2) of this section apply where there are accessible areas in which the equipment's rotating superstructure (whether permanently or temporarily mounted) poses a reasonably foreseeable risk of: (i) Striking and injuring an employee; or (ii) Pinching/crushing an employee against another part of the equipment or another object. (2) To prevent employees from entering these hazard areas, the employer must:		See 4999(j) below.
(i) Train each employee assigned to work on or near the equipment (''authorized personnel'') in how to recognize struck-by and pinch/crush		Training is covered by 3203(a)(7)

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
hazard areas posed by the rotating superstructure.		
(ii) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas. *Exception:* When the employer can demonstrate that it is neither feasible to erect such barriers on the ground nor on the equipment, the hazard areas must be clearly marked by a combination of warning signs (such as ''Danger—Swing/ Crush Zone'') and high visibility markings on the equipment that identify the hazard areas. In addition, the employer must train each employee to understand what these markings signify.	4999(j) Where a rotating crane is positioned to operate in areas where persons may be caught between rotating parts of the crane and outside obstructions or parts of rotating machine deck and nonrotating parts of crane, those danger areas shall be barricaded or other positive means shall be taken to prevent traffic and workers, except the operator from entering such areas while the crane is operating.	Training is covered by 3203(a)(7)
(3) Protecting employees in the hazard area. (i) Before an employee goes to a location in the hazard area that is out of view of the operator, the employee (or someone instructed by the employee) must ensure that the operator is informed that he/she is going to that location. (ii) Where the operator knows that an employee went to a location covered by paragraph (a)(1) of this section, the operator must not rotate the superstructure until the operator is informed in accordance with a prearranged system of communication that the employee is in a safe position.		4999(j) prohibits employees from entering such areas while the crane is operating.
(b) Where any part of a crane/derrick is within the working radius of another crane/derrick, the controlling entity must institute a system to coordinate operations. If there is no controlling entity, the employer (if there is only one employer operating the multiple pieces of	5001(k)(1) When there is a potential for accidental contact by cranes operating within the boom swing radii of one another, the employer shall ensure effective communication to notify crane operators and signal persons of the presence of other cranes to coordinate	Formerly 5001(f)

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
equipment), or employers, must institute such a system.	operations. (2) Where two-way radios are used, a dedicated frequency shall be provided for communication among operators.	
§ 1926.1425 Keeping clear of the load.	§5002. Overhead Loads.	
(a) Where available, hoisting routes that minimize the exposure of employees to hoisted loads must be used, to the extent consistent with public safety.	(a) Operations shall be conducted and the job controlled in a manner that will avoid exposure of employees to the hazard of overhead loads. Wherever loads must be passed directly over workers, occupied work spaces or occupied passageways, safety type hooks or equivalent means of preventing the loads from becoming disengaged shall be used. NOTE: Employees should not work in the area directly beneath a suspended load	
(b) While the operator is not moving a suspended load, no employee must be within the fall zone, except for employees:	(b) While the operator is not moving a suspended load, no employee shall be within the fall zone, except for employees:	
(1) Engaged in hooking, unhooking or guiding a load; (2) Engaged in the initial attachment of the load to a component or structure; or (3) Operating a concrete hopper or concrete bucket.	(1) Engaged in hooking, unhooking or guiding a load; (2) Engaged in the initial attachment of the load to a component or structure; or (3) Operating a concrete hopper or concrete bucket.	
(c) When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection of a load to a component or structure and are within the fall zone, all of the following criteria must be met: (1) The materials being hoisted must be rigged to prevent unintentional displacement.	(c) When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection of a load to a component or structure and are within the fall zone, all of the following criteria shall be met: (1) The materials being hoisted shall be rigged to prevent unintentional displacement.	
(2) Hooks with self-closing latches or their equivalent must be used.		Self-closing hooks covered in 5002(a)

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Exception: ‘‘J’’ hooks are permitted to be used for setting wooden trusses.		This exception not allowed by T8.
(3) The materials must be rigged by a qualified rigger.	(2) The materials shall be rigged by a qualified rigger.	
(d) Receiving a load. Only employees needed to receive a load are permitted to be within the fall zone when a load is being landed.	(d) Receiving a load. Only employees needed to receive a load shall be permitted to be within the fall zone when a load is being landed.	
(e) During a tilt-up or tilt-down operation: (1) No employee must be directly under the load. (2) Only employees essential to the operation are permitted in the fall zone (but not directly under the load). An employee is essential to the operation if the employee is conducting one of the following operations and the employer can demonstrate it is infeasible for the employee to perform that operation from outside the fall zone: (1) Physically guide the load; (2) closely monitor and give instructions regarding the load’s movement; or (3) either detach it from or initially attach it to another component or structure (such as, but not limited to, making an initial connection or installing bracing). Note: Boom free fall is prohibited when an employee is in the fall zone of the boom or load, and load line free fall is prohibited when an employee is directly under the load; see § 1926.1426.	(e) During a tilt-up or tilt-down operation: (1) No employee shall be directly under the load. (2) Only employees essential to the operation are permitted in the fall zone (but not directly under the load). An employee is essential to the operation if the employee is conducting one of the following operations and the employer can demonstrate it is infeasible for the employee to perform that operation from outside the fall zone: (A) Physically guide the load; (B) Closely monitor and give instructions regarding the load’s movement; or (C) Either detach it from or initially attach it to another component or structure (such as, but not limited to, making an initial connection or installing bracing). Note: Boom free fall is prohibited when an employee is in the fall zone of the boom or load, and load line free fall is prohibited when an employee is directly under the load; see §5002.1.	
§ 1926.1426 Free fall and controlled load lowering.	§5002.1. Boom and Load Line Free Fall.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(a) Boom free fall prohibitions. (1) The use of equipment in which the boom is designed to free fall (live boom) is prohibited in each of the following circumstances: (i) An employee is in the fall zone of the boom or load. (ii) An employee is being hoisted. (iii) The load or boom is directly over a power line, or over any part of the area extending the Table A of § 1926.1408 clearance distance to each side of the power line; or any part of the area extending the Table A clearance distance to each side of the power line is within the radius of vertical travel of the boom or the load. (iv) The load is over a shaft, except where there are no employees in the shaft. (v) The load is over a cofferdam, except where there are no employees in the fall zone of the boom or the load. (vi) Lifting operations are taking place in a refinery or tank farm.	(a) Boom free fall prohibitions. (1) The use of equipment in which the boom is designed to free fall (live boom) is prohibited in each of the following circumstances: (A) An employee is in the fall zone of the boom or load. (B) An employee is being hoisted. (C) The load or boom is directly over a power line, or over any part of the area extending the Table A of §5003.1 clearance distance to each side of the power line; or any part of the area extending the Table A clearance distance to each side of the power line is within the radius of vertical travel of the boom or the load. (D) The load is over a shaft, except where there are no employees in the shaft. (E) The load is over a cofferdam, except where there are no employees in the fall zone of the boom or the load. (F) Lifting operations are taking place in a refinery or tank farm.	
(2) The use of equipment in which the boom is designed to free fall (live boom) is permitted only where none of the circumstances listed in paragraph (a)(1) of this section are present and: (i) The equipment was manufactured prior to October 31, 1984; or (ii) The equipment is a floating crane/derrick or a land crane/derrick on a vessel/flotation device.	(2) The use of equipment in which the boom is designed to free fall (live boom) is permitted only where none of the circumstances listed in subsection (a)(1) are present and: (A) The equipment was manufactured prior to October 31, 1984; or (B) The equipment is a floating crane/derrick or a land crane/derrick on a vessel/flotation device.	
(b) Preventing boom free fall. Where the use of equipment with a boom that is designed to free fall (live boom) is prohibited, the boom hoist must have a secondary mechanism or device	(b) Preventing boom free fall. Where the use of equipment with a boom that is designed to free fall (live boom) is prohibited, the boom hoist shall have a secondary mechanism or device	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows:	designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows:	
(1) Friction drums must have: (i) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering. (ii) A secondary braking or locking device, which is manually or automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device). (2) Hydraulic drums must have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure. (3) Neither clutches nor hydraulic motors must be considered brake or locking devices for purposes of this subpart. (4) Hydraulic boom cylinders must have an integrally mounted holding device.	(1) Friction drums shall have: (A) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering. (B) A secondary braking or locking device, which is manually or automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device). (2) Hydraulic drums shall have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure. (3) Neither clutches nor hydraulic motors shall be considered brake or locking devices for purposes of Group 13. (4) Hydraulic boom cylinders shall have an integrally mounted holding device.	
(c) Preventing uncontrolled retraction. Hydraulic telescoping booms must have an integrally mounted holding device to prevent the boom from retracting in the event of hydraulic failure.	Article 94. Hydraulic Cranes and Excavators §4949. Boom Hoist and Supporting Mechanism. *** (b) A holding device shall be provided. (1) On rope boom support machines a ratchet and pawl or other positive locking device shall be provided to prevent unintentional lowering of the boom. (2) For hydraulic cylinder boom support machines, a holding device (such as load checks) shall be provided to prevent unintentional lowering of the boom. ***	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	(d) On a telescoping boom, the retract function shall be capable of controlling 110% of rated load. A holding device (such as load check) shall be provided.	
(d) Load line free fall. In each of the following circumstances, controlled load lowering is required and free fall of the load line hoist is prohibited: (1) An employee is directly under the load. (2) An employee is being hoisted. (3) The load is directly over a power line, or over any part of the area extending the Table A of § 1926.1408 clearance distance to each side of the power line; or any part of the area extending the Table A of § 1926.1408 clearance distance to each side of the power line is within the radius of vertical travel of the load. (4) The load is over a shaft. (5) The load is over a cofferdam, except where there are no employees in the fall zone of the load.	5002.1(c) Load line free fall. In each of the following circumstances, controlled load lowering is required and free fall of the load line hoist is prohibited: (1) An employee is directly under the load. (2) An employee is being hoisted. (3) The load is directly over a power line, or over any part of the area extending the Table A of §5003.1 clearance distance to each side of the power line; or any part of the area extending the Table A of §5003.1 clearance distance to each side of the power line is within the radius of vertical travel of the load. (4) The load is over a shaft. (5) The load is over a cofferdam, except where there are no employees in the fall zone of the load.	